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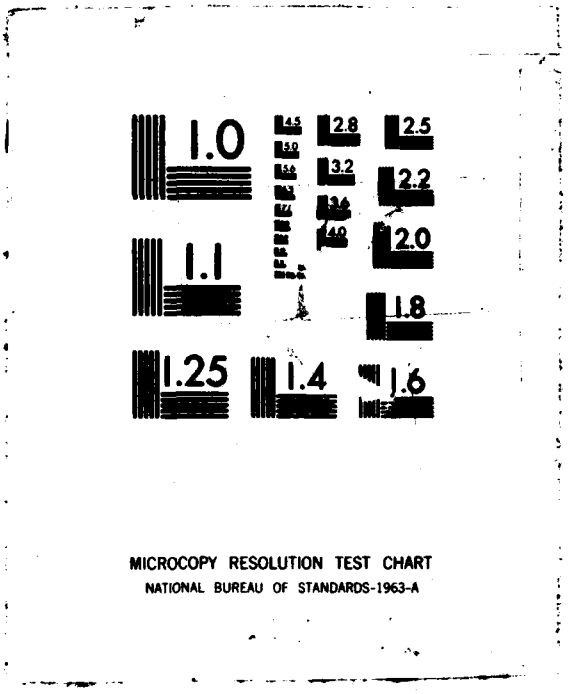
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ENVIRONMENTAL ASSESSMENT FOR LOCK AND DAM 22 MAJOR REHABILITATION

RALLS COUNTY, MISSOURI AND PIKE COUNTY, ILLINOIS

FEBRUARY 1987

US Army Corps of Engineers
Rock Island District

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

NCRPD-E

ENVIRONMENTAL ASSESSMENT

LOCK AND DAM 22 MAJOR REHABILITATION

RALLS COUNTY, MISSOURI
AND
PIKE COUNTY, ILLINOIS

FEBRUARY 1987

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FOR
LOCK AND DAM 22 MAJOR REHABILITATION
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FOR
LOCK AND DAM 22 MAJOR REHABILITATION
RALLS COUNTY, MISSOURI, AND PIKE COUNTY, ILLINOIS

BACKGROUND. Lock and Dam 22 is a component of the inland waterway navigation system of the Upper Mississippi River Basin. Construction, operation, and maintenance of Lock and Dam 22 was authorized by the River and Harbor Act of 1930. Construction commenced in 1933 and was completed in 1935.

An Environmental Impact Statement was prepared for Operation and Maintenance of the Upper Mississippi River Nine-Foot Channel Project Pools 11 Through 22, with the Statement of Finding filed with the Council on Environmental Quality on 28 January 1975.

In 1978, the Inland Waterways Authorization Act (PL 95-502) was signed into law. Section 101 of the Act directed the Upper Mississippi River Basin Commission to prepare a Comprehensive Master Plan for the Management of the Upper Mississippi River System in cooperation with appropriate Federal, State, and local officials.

The Comprehensive Master Plan identified certain measures, both structural and nonstructural, that may lead to increases in navigation capacity. However, the proposed rehabilitation of Lock and Dam 22 covered by this Environmental Assessment includes maintenance and construction work to existing lock and dam features, such as concrete removal and replacement, and sandblasting, painting, mechanical equipment replacement, and electrical equipment replacement. As a result, the rehabilitated structures will retain operating and performance characteristics similar to their original design. Hence, no changes in local or system river traffic or capacity can be attributed to the proposed rehabilitation addressed in this Environmental Assessment. At such time that new features are proposed for the site, they will be evaluated as to their impact on local and system traffic and any resulting cumulative environmental impacts.

Reference Section VI, Compliance with Environmental Statutes Part D, Fish and Wildlife Coordination Act Report, contained in the Pertinent Correspondence attachment.

The U.S. Army Corps of Engineers, North Central and Lower Mississippi Valley Divisions; St. Paul, Rock Island, and St. Louis Districts are currently engaged in planning and construction activities on the Upper Mississippi and Illinois Rivers for the purpose of repairing and updating components of the navigation system on these rivers. Various site-specific environmental documents have been, or are being, prepared which discuss localized effects to natural and cultural resources from rehabilitation of Locks and Dams 2 through 22 on the Upper Mississippi River; and Lockport, Dresden, Marseilles, Peoria, and LaGrange Locks and Dams on the Illinois

River. A Draft Environmental Impact Statement has been prepared for a proposed second lock at Lock and Dam 26 on the Upper Mississippi River. This document is currently under public and agency review. An Environmental Impact Statement will be prepared which will address cumulative impacts of other proposed features of the major rehabilitation effort on the Upper Mississippi and Illinois Rivers which may have the potential to increase navigation traffic. This document is being coordinated with Federal, State, and local agencies having interest or jurisdiction on the Upper Mississippi and Illinois Rivers.

I. PURPOSE AND NEED FOR ACTION.

Completed in 1938, Lock and Dam 22 is approaching the 50-year lifespan typically estimated for concrete structures of this type. The location is shown on Plate 1 - Project Location. Damaged concrete, weathered steel components, and outdated electrical equipment necessitate certain repairs and improvements which are now beyond the scope of routine operation and maintenance activities. Potential failure of deteriorated structural components presents a safety hazard to lock personnel, towboat crews, the general public, and the riverine environment.

In order to reduce future maintenance costs and alleviate safety hazards at Lock and Dam 22, the U.S. Army Corps of Engineers has proposed a 3-year major rehabilitation project under the authority of the River and Harbor Act of 3 July 1930. This Act authorizes the construction and maintenance of the Upper Mississippi River Nine-Foot Channel Navigation Project.

II. PROJECT DESCRIPTION.

The proposed primary rehabilitation activity involves maintenance and construction work, such as concrete removal and replacement, steel work, sandblasting, painting, mechanical equipment replacement, and electrical equipment replacement. Refer to Plate 2 - Proposed Rehabilitation Plan. The facility is described as follows:

A. Navigation Lock. The lock chamber, located on the Missouri shore, is 110 feet wide by 600 feet long, with a maximum lift of 9.8 feet. The lock walls and sills are of concrete construction. Miter-type gates are provided at the upper and lower ends of the lock. The filling and emptying system is the wall-port type.

B. Dam. The dam has a total length of 3,084 feet, consisting of 1,024 feet of gated sections, 460 feet of a nonoverflow earthen dike section, and 1,600 feet of an overflow earthen dam section. The gated section of the dam adjoins Lock 22 and contains 3 roller gates and 10 tainter gates.

The work proposed at this facility involves the following components:

1. Lock Walls. The lock walls will be repaired by removing the deteriorated concrete in the lock chamber and around the miter gates and replacing it with new concrete and armor. The armor will consist of horizontal runs of steel T-section and horizontal and vertical steel corne protection.

2. Approach Dike. The dike will be repaired by placing a 24-inch layer of riprap along the dike.

3. Main Lock Miter Gates. There are two sets of miter gates at the main lock. The upper gates are 27 feet high, and the lower gates are 33 feet high. The gates are riveted steel frame structures covered with steel buckle plate. The upper and lower gates will be overhauled and painted.

4. Emergency/Auxiliary Lock Miter Gates. The emergency/ auxiliary lock is designed to maintain a 6-foot channel between pools 24 and 22 in the event of a catastrophic failure at Dam 22. The emergency lock miter gates are similar to the upper gates of the main lock, but are silted in place on the upstream and downstream sides. The gate leaves are badly deteriorating and are in need of rehabilitation. The silt adjacent to the gates will be removed to facilitate removal of the emergency/ auxiliary lock gates.

5. Main Lock Miter Gate Machinery. The existing machinery will be removed and replaced with new machinery.

6. Lock Tainter Valve Machinery. The existing machinery will be removed and replaced with new machinery and the tainter valves will be cleaned and painted.

7. Lock Electrical Equipment. The existing electrical equipmen including the lighting distribution system, will be removed and replaced wi new equipment.

8. Dam Structure. The dam piers will be repaired by removing the deteriorated concrete and replacing it with new concrete. Exposed mechanical equipment will be cleaned and painted. The operating houses will be rehabilitated by replacing the windows and repairing the deteriorated roof.

9. Roller Gates and Tainter Gates. The insides and outsides of the roller and tainter gates will be cleaned and painted, the side seal plates will be repaired, and the rubber seals will be replaced. The herringbone gear will be replaced on the roller gates.

10. Dam Electrical Equipment. The dam electrical distribution system, including the lighting distribution system, will be completely replaced.

11. Service Bridge. The service bridge will be painted and the walkway replaced with a non-skid grating.

12. Emergency Bulkheads. The emergency bulkheads will be painted and the wood seals will be replaced with rubber seals.

13. Overflow Section. The 1,600-foot overflow section consists of a compacted fill embankment and 20-foot-diameter sheet pile cells. The embankment crown and slopes are covered with riprap stone. Voids in the slush concrete will be filled with grout.

III. ALTERNATIVES.

Alternatives which were considered include:

A. Primary Rehabilitation.

1. No Federal Action. This alternative was not selected because the subject facility is approaching the limit of its serviceable life. Also, rehabilitation of the subject facility is authorized by the River and Harbor Act of 3 July 1930.

2. Rehabilitation of the Facility to Original Design Specifications or Criteria. This alternative was not selected because review of the subject facility under the Major Rehabilitation Program and the Dam Safety Assurance Program indicates that certain features are outdated and/or unsafe under current engineering/safety criteria.

3. Rehabilitation of the Facility to Updated Specifications and Criteria. This is the preferred alternative and is discussed in section II, Project Description, above.

B. Dredging and Disposal Alternatives.

1. No Federal Action. This alternative was not selected due to requirements of other work features.

2. Agricultural Field, Illinois or Missouri. Lack of adjacent properties on the Missouri side and proximity of other previously used sites precluded further pursuit of agricultural field disposal. This is noted as site 3 on Plate 3 - Proposed Disposal Site Locations.

3. Downstream Sites (GREAT 22.38, 22.39, 22.40, and 22.41). 1/ These sites are individually, or collectively, too small for disposal and containment of anticipated material quantities. This is noted as site 2 on plate 3.

4. Saverton Site (GREAT 22.37). This site is approximately 35 acres total, as defined by Federal ownership between the Burlington Northern Railroad embankment and the Mississippi River upstream from the mouth of Lick Creek. Currently, this site contains about 3 to 5 acres

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1/ GREAT is the acronym for Great River Environmental Action Team, which prepared a 1980 report entitled Channel Maintenance Handbook. This report identified historic, current, and potential future disposal sites for channel maintenance work.

of sand material deposited during channel maintenance work between river miles 302 and 304. This is currently the preferred site for disposal of all dredged material from the proposed rehabilitation work at Lock and Dam 22. This is noted as site 1 on plate 3.

IV. AFFECTED ENVIRONMENT.

A. Natural Resources. The project site consists of Lock and Dam 22 and the immediate vicinity. The study area includes Pools 22 and 24, which may be considered the zone of influence for the subject facility. There is no intermediate Lock and Dam 23 or pool. The proposed dredged disposal site, which lies between the town of Saverton, Missouri, and the river, is currently unvegetated sand ringed with young silver maple, willow, and box elder.

Riverine resources, both aquatic and terrestrial, between Quincy, Illinois, and Clarksville, Missouri, were considered during preparation of this report. Tributaries to this reach of the Mississippi River are the Wyaconda, Fabius, North, South, and Salt Rivers at river miles 337.2, 323.2, 321.1, 320.5, and 284.4, respectively.

Pool 22 is approximately 23 miles long and provides permanent deep and shallow water aquatic habitat between Saverton, Missouri, and Quincy, Illinois. About 6,000 acres of federally owned riverine terrestrial habitat is managed by the respective States, with an additional 500-plus acres of flood easement rights held throughout the pool. The majority of federally owned land involves islands and immediate shoreline property.

By maintaining minimum pool elevations for navigation in Pools 22 and 24, the Upper Mississippi River Nine-Foot Channel Navigation Project provides fairly stable year-round water levels in the backwater complex between river miles 273.5 and 325. Used by furbearers, waterfowl, and wading birds, the backwaters are also important spawning areas for commercial and sport fish.

Many temporary, or ephemeral, ponds are interspersed throughout the project area and provide spawning, brooding, and rearing habitat for certain fish, amphibian, and reptile species. These species, in turn, provide a forage base for mammal species such as raccoon, mink, and river otter, as well as the great egret and various herons.

Over a 365-day period for the years 1983 through 1985, tow traffic at Lock 22 averaged 8.2 tows per day. This facility currently has the capability to accommodate winter traffic, with weather permitting year-round use about 50 percent of the time. However, through-system tow traffic is usually reduced during the winter months due to ice conditions from Lock and Dam 19 to the head of navigation. Generally, peaks in tow traffic on the Upper Mississippi occur in the spring when fuels, fertilizer, and empty barges are moved to destinations upriver, and in the fall, as agricultural commodities are moved downriver.

B. Cultural Resources. Construction for the Upper Mississippi River Nine-Foot Channel Navigation Project began in the 1930's and was completed by the early 1940's. Most of the lock and dam complexes are at or very

close to being 50 years old as of 1986. The GREAT II Study, completed in 1980, included a brief overview of the potential significance of the navigation system. Recommendation 5007 contained in the Cultural Resources Work Group Appendix (1980: 85-89) indicates that "the creation of the navigation system is generally accepted as a major engineering event in American history" and that structures (including equipment) may have individual and collective (District) significance under historical, architectural, and/or engineering criteria. It was recommended that the Corps conduct a historical, architectural, and engineering study to assess the significance of the system as a network which is important in the transportation, economic, and engineering history of the Nation.

As a result of a historical survey contract awarded in 1984 to Rathbun Associates of Springfield, Illinois, their staff identified all properties at the lock and dam complexes that appear to be eligible for the National Register of Historic Places. Complexes as a whole were then evaluated, as was the entire Upper Mississippi River Nine-Foot Channel Navigation Project within the Rock Island District. Properties were sorted into Department of the Army historic preservation categories 1-5, and preservation recommendations were made in light of anticipated impacts from potential rehabilitation and hydropower projects.

Rathbun Associates staff determined that only 5 of the 83 individual buildings or structures at Lock and Dam Complexes 11-22 of the Upper Mississippi River Nine-Foot Channel Navigation Project have National Register significance. No Lock and Dam 22 features were included in this list.

Essentially, the State Historic Preservation Officers (SHPO) of Illinois, Iowa, and Missouri feel that the entire Upper Mississippi River Nine-Foot Channel Navigation Project is eligible for listing in the National Register primarily for historical, economic, and operational reasons. Architectural and engineering features appear to be secondary, although selected structures seem to be significant (e.g., Lock and Dam 19 Complex already listed).

The SHPO's of Missouri, Illinois, and Iowa have provided written responses to our request of 4 June 1985 for comments on eligibility, justifications for eligible properties, guidance concerning possible compliance strategies, and opinions on preservation (in-field and documentary) needs.

A staff member from the Advisory Council on Historic Preservation (ACHP) provided this information to Rock Island District in a letter dated 21 June 1985. The ACHP position is that the entire system is eligible, with the exception of several specifically referenced structures at Lock and Dam 19 which are already listed. Overall, there are no significant objections to the major rehabilitation program, even if all the locks and dams are considered eligible. Most rehabilitative actions will not adversely affect those characteristics upon which significance would be based. As long as the attributes of overall configuration and appearance are left intact, objections appear unlikely. Repair of expected and normal wear and "accommodations to modern traffic through minor changes" should not be a problem, although some SHPO/ACHP involvement might be warranted to ensure overall sensitivity of treatment. Significant features would likely have to be rehabilitated in accordance with the Secretary of the Interior's Standards.

At the 4 June 1985 meeting, the SHPO staff members tentatively agreed with the overall ACHP philosophy. The District believes that the primary significance of the system lies in its operation and that it continues to function in response to changing needs and requirements of the Corps mission, technological advancements, and modern traffic characteristics. This philosophy is derived from historical trends in Federal management of the Upper Mississippi River dating back to the 19th century. Federal actions for navigation improvement and control reflect an evolutionary pattern of change, and, thus, the District feels that the major rehabilitation program not only carries out inherent anticipated changes but provides the opportunity for a continued program of responsive and innovative improvement.

The major rehabilitation program merely extends the normal course of adaptive reuse and ensures that the overall original intent for continued development is carried out. In a sense, the navigation system as an entity will never really be 50 years old or complete at any given point in time. Continual modifications have occurred in the past, and a static condition is an unrealistic goal for the future that also is not in the public interest.

The preferred dredge disposal site for Lock and Dam 22 rehabilitation is an existing disposal area covered by several feet of sand.

In a letter dated 19 February 1987, the Missouri SHPO indicated that the proposed disposal activity would have No Effect on significant cultural resources.

V. ENVIRONMENTAL IMPACTS OF THE PREFERRED ACTION.

Effects of the preferred action on natural and cultural resources are summarized in table EA-1.

A. Social Impacts of the Preferred Action.

1. Noise. The project consists of concrete resurfacing, machinery replacement, electrical equipment replacement, and structural metal repair at a large lock and dam facility. Actions incidental to completion of the above work include dredging of various materials around the subject facility, land-based disposal of dredged material, and placement of rock for improvement of scour protection. The town of Saverton, Missouri, is located near the project site and provides background noise only from urban residential traffic. Background noise levels in the project area are limited to those produced by towboat activity and through-dam waterflow. The Burlington Northern Railroad line, which passes through Saverton and the project site, provides temporary, intense elevations in ambient noise.

No sensitive noise receptors, such as schools or hospitals, are located within 1 mile of the project site. The duration and frequency of noise, including activity at this site, is anticipated to be minimal. Any

TABLE EA-1

Effects of the Preferred Action
on Natural and Cultural Resources

Types of Resources	Authorities	Measurement of Effects
Air quality	Clean Air Act, as amended (42 U.S.C. 1657h-7 et seq.)	No significant effect
Areas of particular concern within the coastal zone	Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451 et seq.)	Not present in planning area
Endangered and threatened species critical habitat	Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)	No significant impacts anticipated
Fish and wildlife	Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.)	No significant effect
Floodplains	Executive Order 11988, Flood Plain Management	No significant effect
Historic and cultural properties	National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.)	SHPO coordination for disposal area complete; No Effect determination received. NRHP evaluation completed; MOA pending signature.
Prime and unique farmland	CEQ Memorandum of August 1, 1980; Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act	No significant effect
Water quality	Clean Water Act of 1977, as amended (33 U.S.C. 1251 et seq.)	No significant effect
Wetlands	Executive Order 11990, Protection of Wetlands, Clean Water Act of 1977, as amended (43 U.S.C. 1857h-7 et seq.)	Present in planning area; preservation anticipated
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271 et seq.)	Not present in planning area

observer within 500 feet of the project site would occasionally experience noise levels similar to those from backhoes, pneumatic jackhammers, and other roadway construction equipment. The relative isolation of the project site away from residential property indicates that social impacts from construction noise should be minimal. All such impacts would be temporary

2. Displacement of People. No people would be displaced by the project action. The use of city streets for construction equipment access would be minimal due to most equipment being waterborne.

3. Aesthetic Values. The aesthetic appeal of this constructio activity is low; however, construction will be temporary. The results of the proposed activity, e.g., concrete repair, machinery repair, and painting, should improve aesthetic values over the long term.

4. Desirable Community Growth. The existence of a cost-effective, efficient transportation system provided by the Upper Mississippi River locks and dams has provided stimulus for growth of the river communities and the entire Midwest region. Maintenance of this system will continue to provide growth opportunities.

5. Community Cohesion. Land surrounding the lock and dam is used for agricultural, commercial, residential, or recreational purposes. A public use area and approximately 70 homes are located within a 1-mile radius of the project site. No effect on community cohesion would be expected due to the limited residential development in the project vicinit

B. Economic Impacts of the Preferred Action.

1. Local Property Values. No effect is anticipated on local property values.

2. Local Tax Revenues. Any effect on tax revenues in the area would be negligible.

3. Public Facilities and Services. The subject facility provides an impounded riverine setting used by the public for both consumptive and nonconsumptive recreation. Rehabilitation of the facility will maintain existing benefits derived by the public. Safety at Lock and Dam 22 would improve following the proposed rehabilitation of the facility The rehabilitation would result in lowered probability of service interruptions for maintenance and repair, thus benefitting both commercial and recreational craft. Temporary interruptions in public use are anticipated during construction; however, scheduling of certain project activities to avoid heavy use periods should minimize interruptions in public use. Completion of the project will assure the integrity of the structure and improve this important public facility. Without the project, the facility will continue to deteriorate and would be increasingly subject to shutdown and catastrophic failures.

4. Employment. The proposed rehabilitation project would temporarily increase area employment during the construction phase. It is anticipated that fewer than 100 workers would be employed for the rehabilitation project, with approximately 85 percent of these being local hires. Long-term effects of the project on the permanent employment and labor force of the two-county area would be related to community and regional growth.

5. Business and Industrial Activity. Negative impacts to commercial navigation interests which would result from deterioration of the subject facility will be avoided. No improvement in lock transit time is anticipated. Temporary interruptions to river traffic will be minimized by project scheduling. Contracting the proposed work would result in moderate benefit to the successful contract bidder.

6. Displacement of Farms. No farms will be displaced by the project action.

7. Regional Growth. Effects on regional growth are anticipated to be negligible. However, failure to rehabilitate and maintain this facility would eventually result in a shutdown of the navigation system. This would, in turn, have a negative impact on regional growth. A large portion of the region's economy is based on agricultural exports. Interruptions to or failure of the region's transportation network, or adoption of transportation measures which do not minimize user costs, will further degrade the Nation's and the region's ability to compete with offshore exporters. Failure to compete in the world agricultural market will eliminate what was historically our largest export trade and will have a disastrous impact on the Midwest's agricultural and transportation industries.

C. Environmental Impacts of the Proposed Action.

1. Manmade Resources. Pools 22 and 24, above and below the project site, respectively, may be considered manmade resources inasmuch as they are natural resources modified by man to facilitate waterborne commerce on the Upper Mississippi River. They are created and controlled by operation of the subject facility in concert with other components of the Upper Mississippi River Nine-Foot Channel Navigation Project. The subject facility is a manmade resource and is a vital part of the national infrastructure.

At this time, rehabilitation of the subject facility is anticipated to maintain existing navigation conditions in Pools 22 and 24. Completion of the subject project should contribute to alleviation of existing problems involving degradation of manmade resources of the Upper Mississippi River Nine-Foot Channel Navigation Project.

2. Natural Resources. The majority of project activities will take place on the facility structure itself, and therefore will have negligible effect on natural resources. Potential sources of impacts

from a project of this nature involve sandblast residue, paint-solvent overspray, concrete debris, and metal scrap. Other materials to be removed from the project site are asbestos insulating coverings from electrical components and polychlorinated biphenyl (PCB) contaminants contained in electrical transformers. Preliminary contact with the U.S. Environmental Protection Agency has been made. The U.S. Army Corps of Engineers, Rock Island District, will maintain all applicable records and manifests for identification and disposal of these materials. Sandblast residue and paint overspray will be controlled by the use of tarps or other containment devices. Concrete debris and metal scrap will be removed and disposed of in compliance with applicable statutes.

Dredging activities at the emergency lock area will destroy existing benthic populations. Approximately 20,000 cubic yards of fine sediments will be removed. Composed primarily of accreted silt and clay, this type of sediment would typically support a community of burrowing invertebrates such as mayfly larvae, chironomids, and diptera larvae. Following dredging and rehabilitation activities, sediment accretion is anticipated to resume on the upstream side of the emergency miter gates. This area would typically be recolonized by invertebrates shortly thereafter. Sediment accretions on the downstream side of the emergency miter gates also are anticipated to resume.

3. Cultural Resources. Federal agencies are required to find ways to avoid impacts if prudent and feasible measures can be found. Likewise, Federal agencies also are required to repair and maintain significant (or potentially significant) historic properties under their jurisdiction. Overall, the major rehabilitation program has been formulated to achieve both of these mandates. Most of the rehabilitation actions are minor in scope and will have no adverse effect on characteristics which contribute to the significance of the navigation system as a whole or individual structures within it.

Rehabilitation actions generally can be defined as major repair and maintenance items expected as a result of long-term wear and deterioration of aged features and requiring large capital and manpower investments beyond the capabilities of routine O&M. These and the improvement actions will not appreciably affect the overall appearance and operation of the navigation system. Many of the actions are necessary to ensure continued safe and efficient operation. Concrete, armor, and painting rehabilitation actions will preserve existing conditions. Window, roof, and door replacements will be treated with sensitivity to preserve the overall appearance of the structures involved. The Secretary of the Interior's Standards (and the ACHP's Manual of Mitigation Measures, if applicable) will be used when developing plans and specifications. Electrical/mechanical work will be internal and not visually observable for the most part.

The ACHP defines "effect" as "any condition of the undertaking [which] causes or may cause any change, beneficial or adverse, in the quality of the historical, architectural, archeological, or cultural characteristics

that qualify the property to meet the criteria of the National Register (36 CFR part 800.3(a))." Undertakings may affect visual, audible, or atmospheric elements that alter characteristics such as integrity of location, design, feeling, materials, workmanship, or setting. Additionally, secondary impacts might occur, such as construction of new facilities incongruent with the "as-listed" character of historic properties. This occurrence also could be viewed as a continuation of the natural course of navigation system evolution and, in a sense, a contribution to overall significance on a broader scale.

Because of the nature of major rehabilitation plans, Criteria 2, 4, and 5 (36 CFR Part 800) do not apply. Criterion 1 applies because some minor alterations will occur, and Criterion 3 would apply primarily for guide wall extensions. Guide wall extensions are not proposed as part of this project, nor is a guard wall. Those features will be addressed in a forthcoming EIS on system-wide improvements. For the most part, rehabilitation actions will be unobtrusive, not visible to the public, and will not affect those characteristics which contribute to National Register significance. Beneficial effects that will accrue include the general upkeep of the system and the extension of its operating life. Safety, national defense, energy efficiency, and economic benefits are not strictly historical but are certainly in the public interest. These benefits are those for which the system was constructed in the first place and thus become intangible elements contributing to the overall significance of the system.

VI. COMPLIANCE WITH ENVIRONMENTAL QUALITY STATUTES. (A summary of compliance can be found in table EA-2.)

A. Endangered Species. As indicated in the Fish and Wildlife Coordination Act Report (FWCAR) dated 29 July 1986, four federally listed endangered species may utilize the project area: gray bat (Myotis grisescens), Indiana bat (Myotis sodalis), bald eagle (Haliaeetus leucocephalis), and fat pocketbook pearly mussel (Potamilus capax). The following discussion constitutes the Biological Assessment (BA) for this project. As mentioned on pages EA-1 and EA-16, no increase in navigation capacity or transit time is anticipated for the project action. Therefore, no system-wide impact or effect beyond maintenance of existing conditions is anticipated for the above species.

As provided in the FWCAR, no gray bats or Indiana bats have been specifically documented in the immediate project area, although use of the project area for foraging is possible. Habitat components required by the gray bat include caves for both winter hibernaculae and summer maternity colonies, with foraging occurring throughout forested hillsides, ridgetops, and riparian areas. Summer nursery caves have been found in both Ralls and Pike Counties near the Mississippi River. Because the Indiana and gray bats are usually associated with flowing water, it is likely that the insect varieties produced by these aquatic systems constitute preferred food items or fulfill certain dietary requirements for these bat species.

No cave habitat will be affected by the proposed project. No aquatic food web or significant insect production system will be altered by any activity associated with rehabilitation of Lock and Dam 22. Part of the work is to

TABLE EA-2

Relationship of Plans to Environmental Protection Statutes and Other Environmental Requirements

Federal Policies	Compliance
Archaeological and Historic Preservation Act, 16 U.S.C. 469, et seq.	Full compliance
Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	Full compliance
Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.	Full compliance
Coastal Zone Management Act, 16 U.S.C. 1451, et seq.	Not applicable
Endangered Species Act, 16 U.S.C. 1531, et seq.	Full compliance
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not applicable
Federal Water Project Recreation Act, 16 U.S.C. 460-1(12), et seq.	Full compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 601, et seq.	Full compliance
Land and Water Conservation Fund Act, 16 U.S.C. 460/-460/-11, et seq.	Not applicable
Marine Protection Research and Sanctuary Act, 33 U.S.C. 1401, et seq.	Not applicable
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Full compliance
National Historic Preservation Act, 16 U.S.C. 470a, et seq.	Full compliance
River and Harbor Act, 33 U.S.C. 403, et seq.	Full compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Not applicable
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Full compliance
Flood Plain Management (Executive Order 11988)	Full compliance
Protection of Wetlands (Executive Order 11990)	Full compliance
Environmental Effects Abroad of Major Federal Actions (Executive Order 12114)	Not applicable
Farmland Protection Act	Full compliance
Analysis of Impacts on Prime and Unique Farmland (CEQ Memorandum, 11 Aug 80)	Full compliance

NOTES

1. Full compliance. Having met all requirements of the statute for the current stage of planning (either preauthorization or postauthorization).

2. Partial compliance. Not having met some of the requirements that normally are met in the current stage of planning. Partial compliance entries should be explained in appropriate places in the report and referenced in the table.

3. Noncompliance. Violation of a requirement of the statute. Noncompliance entries should be explained in appropriate places in the report and referenced in the table.

4. Not applicable. No requirements for the statute required; compliance for the current stage of planning.

Bald eagles are generally limited to winter residency in the project area. Eagle use has varied from 14 during the mild winter of 1985-1986 to 110 birds during the winter of 1978-1979. Temporary disruption of foraging behavior is the only anticipated effect of construction activity around the project site. There are no records of eagle nesting in the project area. Given the high mobility of the species and the proximity of similar available foraging habitat, it is anticipated that disturbance of foraging birds will not affect the wintering bald eagle population.

The fat pocketbook has been collected on substrate grades ranging from mud to fine gravel, in depths from a few inches to more than 8 feet. The mussel's life cycle is unknown. Consultation with U.S. Fish and Wildlife Service (FWS) staff regarding habitat requirements for this species indicates that substrate stability and flowing water are the known requirements for the fat pocketbook.

Project activities will be limited to the immediate lock and dam site, where highly variable current velocities typically prevent establishment of mussel communities. Construction debris, paint overspray and sandblast residues which could enter the riverine environs and affect filter-feeding organisms are to be controlled, to the extent possible, by the use of tarps or screens at the work site.

State-listed endangered species of concern, as provided by the State of Missouri, include the previously mentioned Federal species and the rock pocketbook mussel, hickory-nut mussel, lake sturgeon, and burbot.

No impacts to State-listed mussels are anticipated for the project site, due to probable unsuitable habitat. A mussel bed is located about 1 mile downstream of the project site. Containment of construction debris and paint residues will be attempted through the use of tarps and screen to minimize entry of contaminants to the riverine system. Elevated turbidity, debris, and residue levels reaching the area of the mussel bed will be minimal and temporary and are anticipated to have no effect on endangered mussel species in the project area.

No critical habitat has been identified for the lake sturgeon or the burbot in the project area. It is anticipated that these species will avoid the project area during construction activity, and will therefore ot be affected by the project action.

State-listed species provided by the State of Illinois included the gray and Indiana bats, and several prairie, woodland, and wetland plant species. Impact to these bat species is described above. All impacts to vegetation will be limited to lock and dam property which is periodically mown or cut, and to volunteer annuals, willow seedlings, and other common vegetation which occur on the periphery of the disposal site. No impact to State-listed plant species is expected from the project as currently proposed. For the foregoing reasons, no significant impact to any endangered species, either Federal or State, is anticipated to result from this project as currently proposed.

be performed during winter months, and most of the work will take place duri daylight hours, thus avoiding disturbance to the foraging activities of these species. Therefore, no impact to endangered bat species is foreseen.

B. Cultural Resources. Between 1980 and 1984, the Rock Island District received several objections from SHPO's on rehabilitation and hydropower projects. Objections were rooted in the fact that the cultural study had not been done and, therefore, no basis for evaluating effects pursuant to Section 106 was available.

In response to SHPO objections and Federal mandates to identify and evaluate historic properties, a contract was awarded to Rathbun Associates of Springfield, Illinois, in May of 1984 to complete the necessary historical, architectural, and engineering study through a comprehensive documents search, field evaluations, and Level IV HABS/HAER documentation. Preliminary National Register evaluations were developed in accordance with 36 CFR, Parts 60 and 63, supplemented by Department of the Army historic preservation guidelines contained in AR 200-1, AR 420-40, and Technical Manual 5-801-1. Preservation recommendations also were developed for specific lock and dam complexes and individual structures based upon the significance evaluations. These recommendations were developed utilizing the above regulations and the Secretary of the Interior's Standards for rehabilitation projects (National Park Service 1983; Heritage Conservation Service 1979). Copies of the draft and final reports were distributed to the appropriate SHPO's (IL, IA, MN, WI), Corps elements (NCD, NCS, LMV, LMS), and the ACHP for comment and filing, respectively.

Coordination between four SHPO offices and the two Federal agencies was a fairly complex procedure. The process was further complicated by the fact that the Upper Mississippi River Nine-Foot Channel Navigation Project as a whole falls under the jurisdiction of three Corps districts from two separate divisions. Hence, two meetings were held at the Rock Island District to discuss the study results, National Register eligibility issues, and possible compliance issues related to the major rehabilitation program.

The first meeting was held on 4 October 1984, just prior to submission of the draft report. Rathbun Associates staff made a presentation to Rock Island District staff and SHPO staffs from Iowa and Illinois. Because of problems in obtaining review comments and the complexity of issues involved, a second meeting was held on 4 June 1985. In addition to Corps staff from the Rock Island and St. Paul Districts, SHPO representation included the States of Missouri, Iowa, and Illinois. (Wisconsin declined to participate, as did St. Louis District, Corps of Engineers.)

A cultural resources overview report with Programmatic Memorandum of Agreement (PMOA) was prepared to provide for the necessary coordination and project planning for Locks and Dams 11 through 22 pursuant to the National Historic Preservation Act and related guidelines and implementing regulations. This report was completed in March 1986 and reviewed by the Illinois, Iowa, and Missouri SHPO's and staff from the ACHP. Letters of

comment received to date are attached. Essentially, the three SHPO's agree with the impact assessment presented in the report entitled Major Rehabilitation Program, Mississippi River Locks and Dams 11 Through 22 in the Rock Island District: Overview and Cultural Resources Compliance Report with a Process Memorandum of Agreement. The reviewers also tentatively agreed with the proposed PMOA (see correspondence attachment) with minor revisions in review requirements. The Missouri SHPO also recommended that Rock Island District formally commit to taking the lead on a formal nomination of the Mississippi River Locks and Dams to the National Register in conjunction with St. Paul and St. Louis Districts sometime in the future. As soon as ACHP comments are received, PMOA revision and processing will be pursued.

C. Fish and Wildlife Coordination Act. The project is being coordinated with the U.S. FWS, the Illinois Department of Conservation, the Missouri Departments of Conservation and Natural Resources, and other interested agencies and organizations. The FWCAR, dated 29 July 1986, is contained in the pertinent correspondence attachment to this report. Since completion of the FWCAR, additional coordination meetings and discussions have been held between the District and FWS in an attempt to resolve concerns. Other correspondence concerning these meetings is included in the pertinent correspondence attachment.

The FWS included the following recommendations in the FWCAR for the project:

1. Remove the upper guard wall and air bubbler from the proposed plan.

District Response: The air bubbler system has been deleted from the proposed plan. The proposed guard wall has been deleted from this project.

2. No bottomland hardwoods be cleared.

District Response: Concur. Access to the proposed disposal site is currently devoid of vegetation as is most of the disposal site itself. However, depending on the disposal containment area design requirements of the State of Missouri, some enlargement of the current site may occur. The FWS will have further opportunity to review plans for disposal through the processes of Clean Water Act compliance.

3. All submerged riprap be 3 to 4 feet in diameter or greater.

District Response: Design criteria call for the use of the largest grade stone feasible to stabilize bedding rock and rockfill. Riprap 3 to 4 feet in diameter or greater is often referred to as derrick stone which requires special handling and equipment for placement. While we recognize the benefits of large stone, it only will be used where necessary for rockfill stabilization. The extra floating plant, boat activity, and associated fuel consumption required for extensive use of derrick stone present other environmental and economic problems.

4. Resurfacing of the earthen dike be done in such a manner as to not prevent fishermen access.

District Response: Concur.

5. Means be investigated to improve walk-in fishing access.

District Response: Concur, within legal/liability constraints posed by operation of the subject facility.

6. Rock and debris from the main lock chamber be disposed in an upland non-wetland location.

District Response: Concur.

7. A composite analysis of the sediments in the auxiliary lock chamber be performed to determine organic and metal content.

District Response: This was accomplished in August and September 1986. Information regarding ambient water, sediment, and dredged elutriate testing has been provided to appropriate State agency staff during coordination of dredged disposal activities. This information also may be found in the Clean Water Act 404(b)(1) Evaluation for this project.

8. Assuming no significant pollutants in the sediments, dredged material should be barged to the Saverton disposal site and revegetated with native grasses.

District Response: Concur. As of September 1986, the only potential water quality problem involves ammonia-nitrogen levels. Further coordination will be pursued to incorporate features in the disposal plan to ameliorate ammonia-nitrogen problems.

9. An analysis of the possible increases in navigation traffic be done (see our letter of 7 April 1986 in the Pertinent Correspondence attachment). This should be a cumulative assessment and should include all proposed rehabilitation work and the Second Lock proposed for Lock and Dam 26(R).

District Response: As your agency is aware, this process is currently under way in conjunction with the St. Paul and St. Louis Districts.

During the coordination process, the Rock Island District has provided various Federal and State agencies with information regarding the subject project, and the major rehabilitation program as a whole. Meetings were

held with local and regional U.S. Fish and Wildlife Service staffs to resolve concerns regarding potential navigation capacity and traffic increases presumed by that agency and State conservation agencies. As a result of this coordination effort, the Rock Island District has initiated economic and environmental studies beyond individual lock and dam rehabilitation projects, encompassing the overall rehabilitation program on the Upper Mississippi River, including the Illinois Waterway.

As agreed upon by the Corps of Engineers and the FWS, site-specific environmental assessments are being prepared for those features of the major rehabilitation effort that do not have the potential to increase navigation traffic and cause cumulative environmental impacts on the Upper Mississippi River and Illinois Waterway. In addition, the Corps of Engineers has agreed to prepare an additional NEPA document which will assess the potential for cumulative environmental impacts for those rehabilitation features the FWS has identified as possibly allowing or causing an increase in navigation traffic, from Locks and Dams 2 through 22 on the Mississippi River, as well as at the locks and dams on the Illinois Waterway. The Rock Island, St. Paul, and St. Louis Districts, as well as the North Central and Lower Mississippi Valley Divisions of the Corps of Engineers, have been meeting to discuss the format and schedule for preparation of such a document. The scoping process for this EIS which involves Federal and State agencies, other groups, and the public will begin in the near future. The draft EIS is scheduled to be released for public review in March 1988.

D. Wild and Scenic Rivers Act. No rivers listed as "wild and scenic" or rivers in the inventory for listing as "wild and scenic" will be affected by the project.

E. Executive Order 11988 (Flood Plain Management). Executive Order 11988 directs Federal agencies to: (1) avoid development in the floodplain unless it is the only practical alternative; (2) reduce the hazards and risks associated with floods; (3) minimize the impact of floods on human safety, health, and welfare; and (4) restore and preserve the natural and beneficial values of the floodplain. The proposed action is in accordance with Executive Order 11988.

F. Executive Order 11990 (Protection of Wetlands). Executive Order 11990 directs Federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when a practicable alternative exists. Wetland definitions may apply to bottomland and shoreline areas within the project area.

No wetland or bottomland hardwood areas will be affected by the project as proposed. Shoreline access to the disposal site is lined by seedling to sapling-sized willow, box elder, and silver maple. As currently proposed, no vegetation will be cleared for disposal site access. The disposal site is a large previously used sand disposal area.

G. Clean Water Act. The project design will incorporate features to minimize impacts to water quality. Minimal fill material is being deposited in the aforementioned watercourse with no return water from dredging activity anticipated; therefore, processing under Sections 401 and 404 of this act is being pursued. (Reference the attached Section 404(b)(1) Evaluation.)

H. Clean Air Act. Exhaust fumes and fugitive dust particles from construction equipment and activities would produce moderate, temporary air quality imapcts. No long-term impact to air quality is anticipated by the project action.

VII. ENVIRONMENTAL IMPACTS OF THE OTHER ALTERNATIVES.

A. Preliminary Rehabilitation.

1. No Action. This alternative would allow the deterioration of the subject facility to a potentially inoperable condition and could not be stopped by routine O&M. Impacts could be incurred through loss of pool, flooding, rerouting of commodities to land-based transport, either short-haul around the facility or long-haul to final destination points, and a variety of other consequential activities resulting from instability of Pool 22 and the remainder of the waterway system. Sediment would continue to fill the emergency lock, and scour hole development around the dam would continue. Regulation of Pool 21 would be hindered by lack of control at Dam 22.

2. Rehabilitation of the Facility to Original Design Specifications or Criteria. Other than essentially the same short-term effects as noted for the preferred alternative 3, there would be no overall change from existing conditions.

B. Dredging and Disposal.

1. No Federal Action. Existing conditions would remain unchanged. Sedimentation would continue to fill the emergency lock area.

2. Agricultural Field, Illinois or Missouri. This alternative involves hydraulic dredging and would require the use of up to 10 acres for containment basin construction depending on design requirements of either State. Depending on timing of contractor activities and drying time of disposed material, crop loss could result over two seasons. Impacts to wildlife would be negligible due to seasonally limited cover on the disposal site. In Iowa, a similar disposal method was employed for dredging of Swift Chute, adjacent to Lock and Dam 18, in Des Moines County Drainage District No. 7, and resulted in improved tilth and fertility on the disposal site.

3. Downstream Sites. Use of these sites for fine sediment disposal would require clearing or burying existing willow thickets and constructing a sheet pile wall to contain dredged effluent during settling. Clearing or burying acres of willow thicket would displace resident and

migratory avifauna which utilize such growth for nesting, feeding, and loafing cover. Also, in order to prevent reentry of these sediments into the Mississippi River, the riverward bank of the settled sediment would require armoring. These sites are periodically flooded and would possibly limit potential revegetation, depending on the final elevation of the disposed sediment.

VIII. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED.

Dredge work, rock placement, and activities by work vessels will disrupt the local aquatic environment at Lock and Dam 22. Benthic constituents inhabiting the work areas will be destroyed. The period of aesthetic effect from silt disposal will depend on the season of disposal and subsequent planting work by the Corps. Temporary impacts to air and water quality are unavoidable.

IX. RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

As a vital component in the national transportation infrastructure, Lock and Dam 22 will continue to serve navigation interests, as well as maintain 23 miles of pooled river aquatic and terrestrial habitat. Without the short-term use of the environment for rehabilitation activities, Lock and Dam 22 will continue to deteriorate, eventually reaching an unsalvageable condition.

X. ANY IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IF THE PROPOSED ACTION SHOULD BE IMPLEMENTED.

The property currently occupied by the lock and dam, and the formerly unpooled 23 miles of riverine habitat (pre-1930's condition) should be considered irretrievable for the life of the project. Time, labor, fuel, and other necessary construction materials also are irretrievable commitments.

XI. RELATIONSHIP OF THE PROPOSED PROJECT TO LAND-USE PLANS.

The operation and maintenance of Lock and Dam 22 do not conflict with any known Federal, State, or local land-use plans.

XII. CONCLUSIONS.

Environmental effects should not be significant. The project design will incorporate features to minimize or avoid impacts to natural and cultural resources. Dredged material disposal has been, and will be, coordinated with appropriate Federal and State agencies. No project activities will take place prior to certification, or waiver of certification, under applicable purvues of the Clean Water Act.

XIII. COORDINATION. Coordination for the project will be maintained with the following State and Federal agencies:

A. U.S. Fish and Wildlife Service

B. U.S. Environmental Protection Agency

C. Illinois Environmental Protection Agency

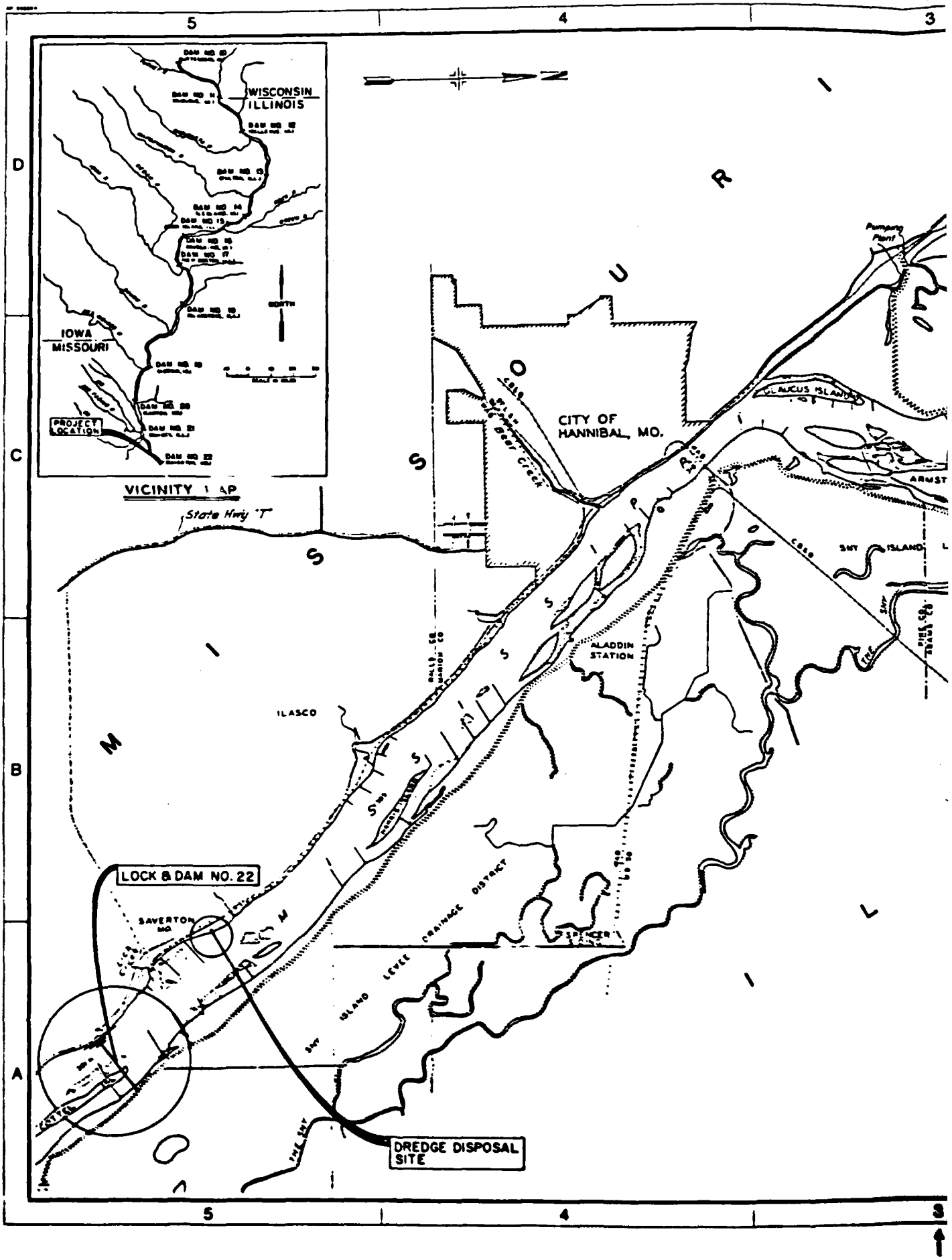
D. Illinois Department of Conservation

E. Missouri State Historic Preservation Officer

F. Advisory Council on Historic Preservation

G. Missouri Department of Conservation

H. Missouri Department of Natural Resources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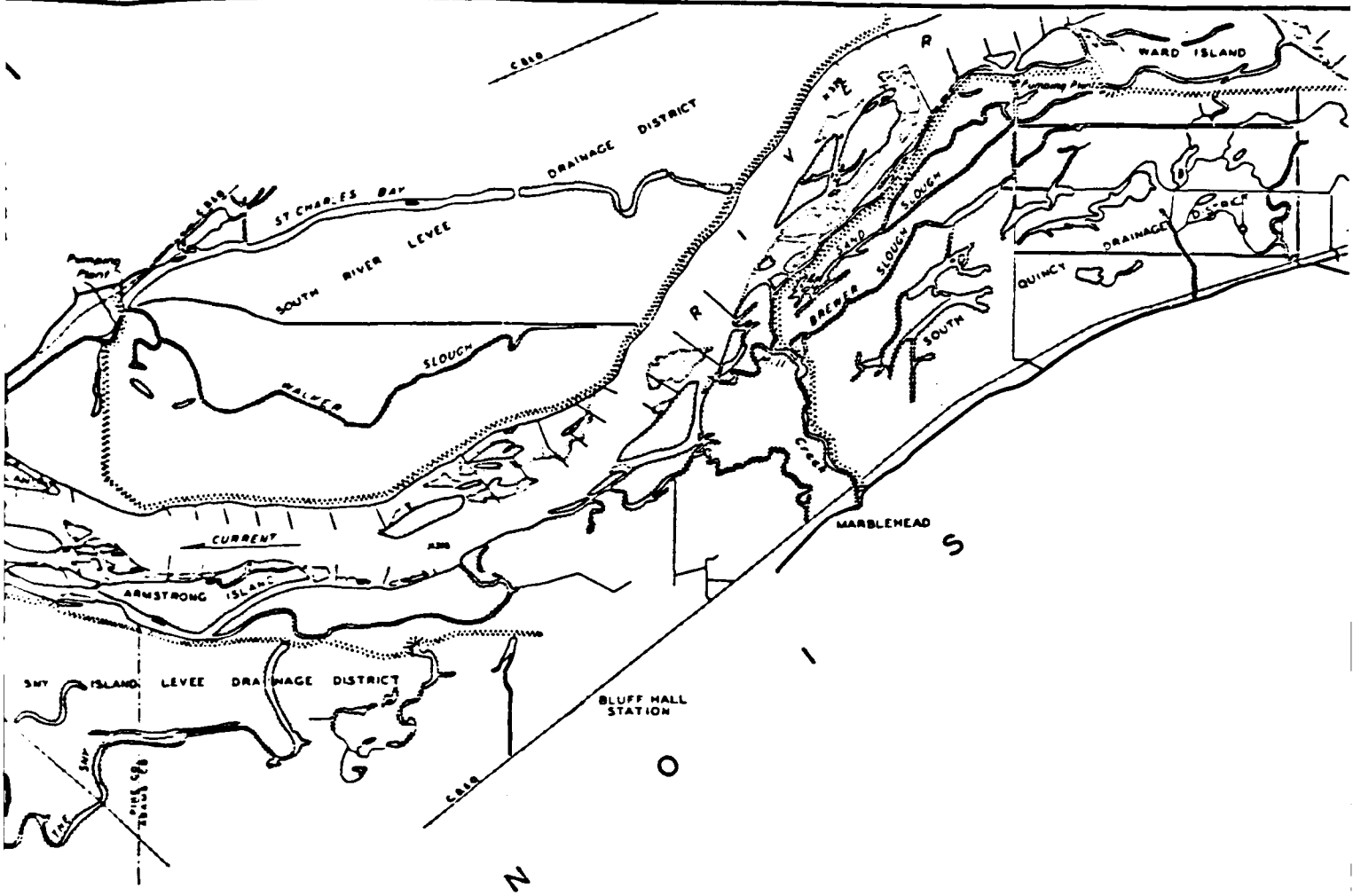


Note:
Mileage shown is upstream from the mouth of the Ohio River

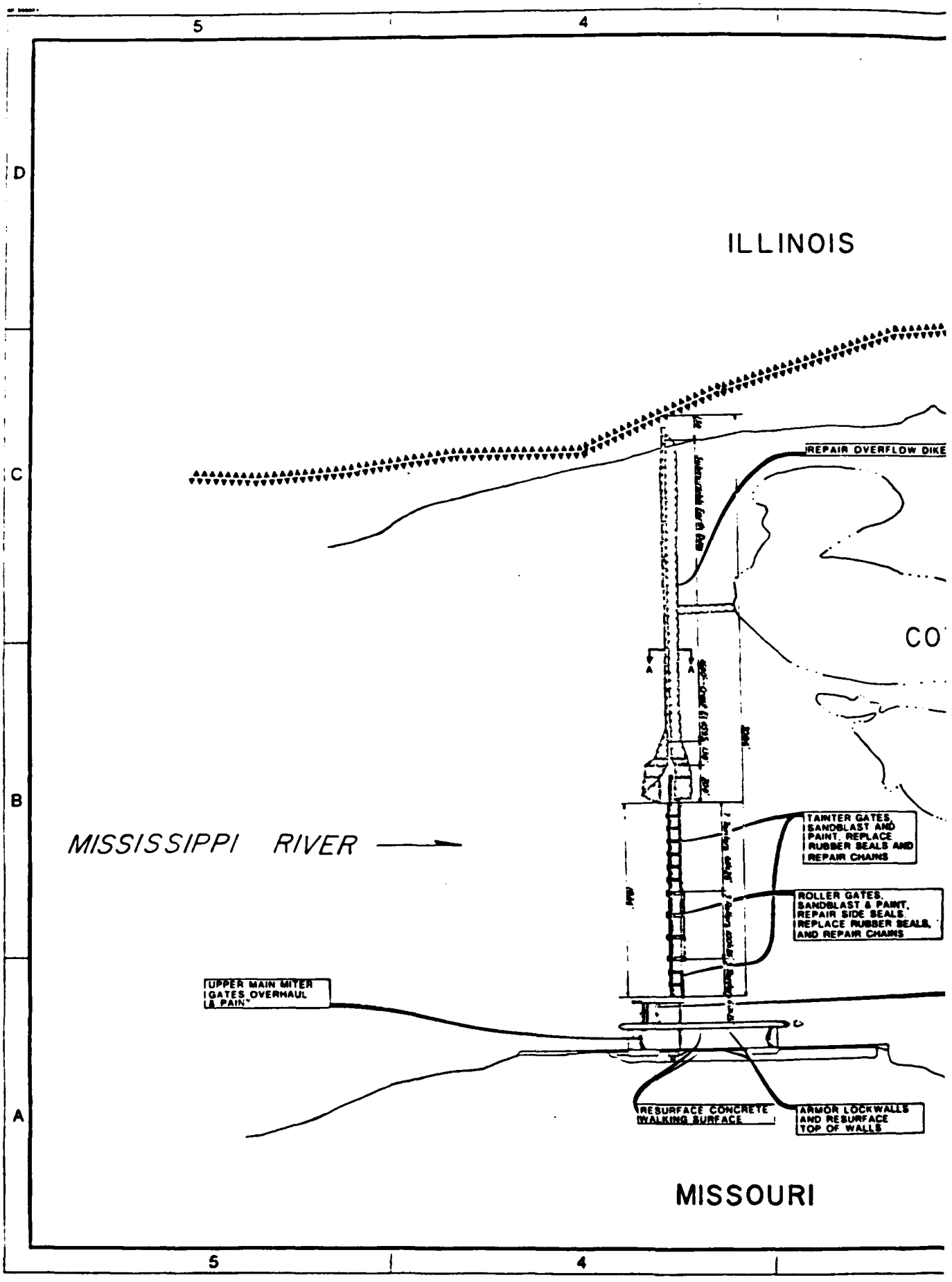
Symbol	Description of Revisions	Date	Approved

U. S. ARMY ENGINEER DISTRICT, ROCK ISLAND
CORPS OF ENGINEERS

MISSISSIPPI RIVER
LOCK & DAM NO. 22

PROJECT LOCATION

PLATE I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ROLLER GATES. SANDBLAST & PAINT, REPAIR SIDE SEALS, REPLACE RUBBER SEALS, AND REPAIR CHAINS
UPPER MAIN MITER GATES OVERHAUL & PAIN
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ARMOR LOCKWALLS AND RESURFACE TOP OF WALLS
MISSOURI
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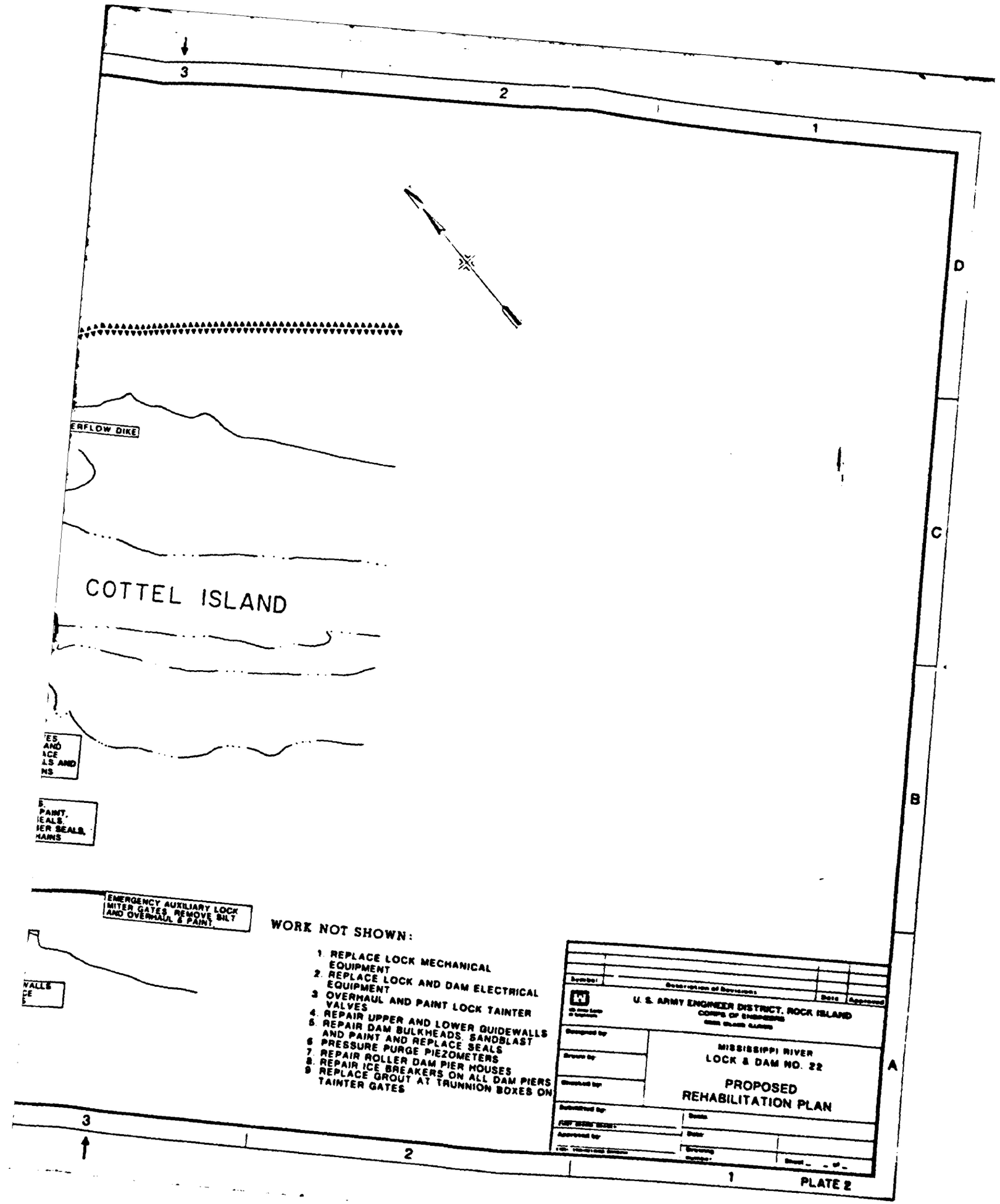
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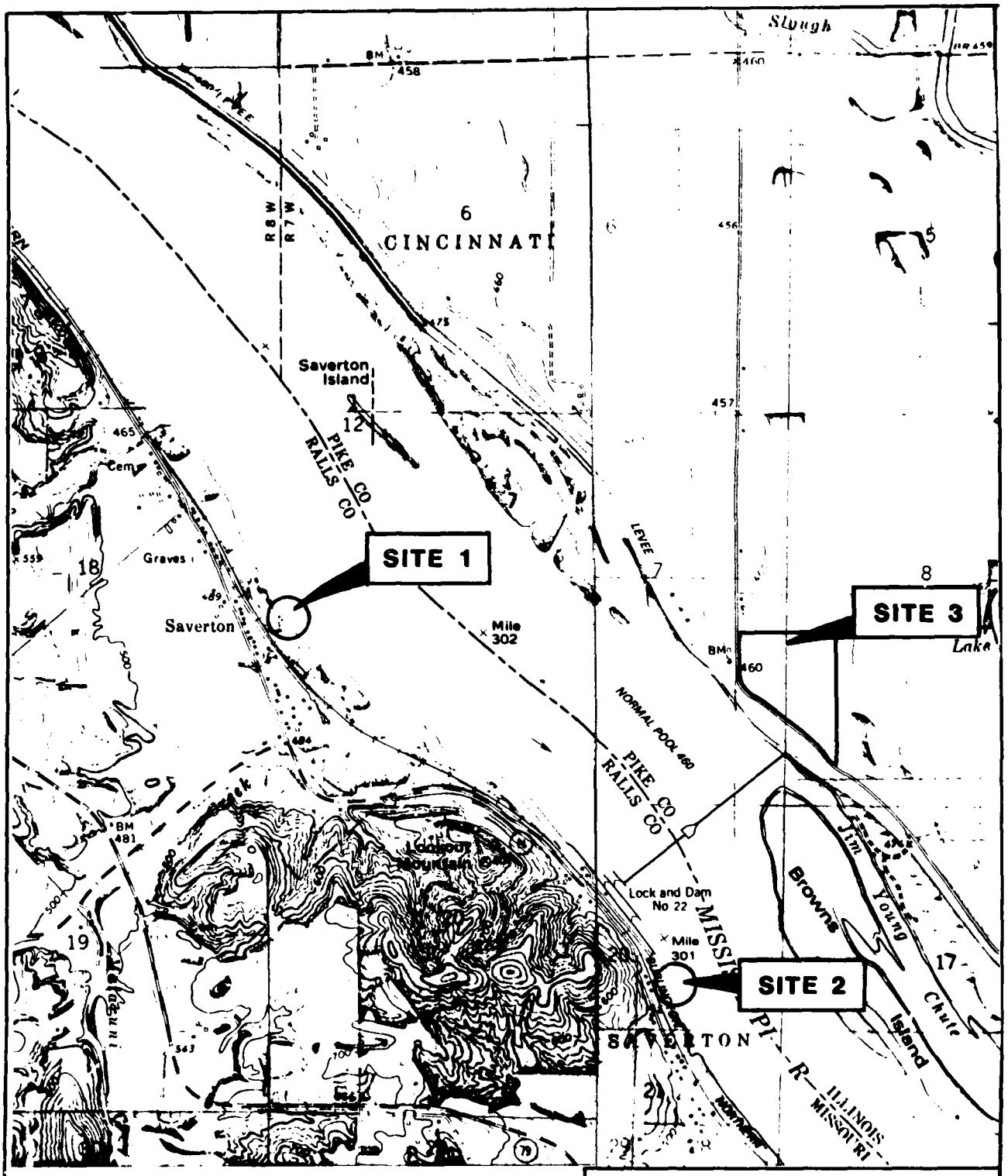
ERFLOW DIKE
COTTEL ISLAND
EMERGENCY AUXILIARY LOCK
MITER GATES REMOVE SILT
AND OVERHAUL & PAINT
WORK NOT SHOWN:
1. REPLACE LOCK MECHANICAL EQUIPMENT
2. REPLACE LOCK AND DAM ELECTRICAL EQUIPMENT
3. OVERHAUL AND PAINT LOCK TAINTER VALVES
4. REPAIR UPPER AND LOWER GUIDEWALLS
5. REPAIR DAM BULKHEADS, SANDBLAST AND PAINT AND REPLACE SEALS
6. PRESSURE PURGE PIEZOMETERS
7. REPAIR ROLLER DAM PIER HOUSES
8. REPAIR ICE BREAKERS ON ALL DAM PIERS
9. REPLACE GROUT AT TRUNNION BOXES ON TAINTER GATES
U. S. ARMY ENGINEER DISTRICT, ROCK ISLAND
CORPS OF ENGINEERS
MISSISSIPPI RIVER
LOCK & DAM NO. 22
PROPOSED
REHABILITATION PLAN
PLATE 2



PROPOSED
DISPOSAL SITE LOCATIONS

PLATE 3

FINDING OF NO SIGNIFICANT IMPACT

FINDING OF NO SIGNIFICANT IMPACT

I have reviewed the information provided by this Environmental Assessment, along with data obtained from Federal and State agencies having jurisdiction by law or special expertise, and from the interested public. I find that major rehabilitation of Lock and Dam 22 at Saverton, Missouri, will not significantly affect the quality of the human environment. Therefore, it is my determination that an Environmental Impact Statement is not required. This determination will be reevaluated if warranted by later developments.

Alternatives considered include: (a) No Federal Action; (b) Rehabilitation of the Facility to Original Design Specifications or Criteria; and (c) Rehabilitation of the Facility to Updated Specifications and Criteria.

Factors considered in making a determination that an Environmental Impact Statement was not required were as follows:

a. No long-term adverse impacts to natural and cultural resources are anticipated. No endangered species, either State or Federal, will be affected by the project action.

b. No expansion in the navigation capacity of the Nine-Foot Channel will result from the proposed activity.

c. Land use after the project should remain unaltered, and no economic impacts to the project area are anticipated.

_____
Date

Neil A. Smart
Colonel, Corps of Engineers
District Engineer

PERTINENT CORRESPONDENCE

ATTACHMENT 2 of 4

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P O BOX 2004
ROCK ISLAND ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

February 11, 1985

Planning Division

Mr. Fred Lafser
State Historic Preservation Officer
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102

Dear Mr. Lafser:

We are currently formulating plans for a rehabilitation project at Lock and Dam 22 at river mile 301.2, Saverton, Missouri. Enclosed is a preliminary plan and section drawing which illustrates the work involved. With the exception of the guide wall and guard wall, the rehabilitation work will maintain existing conditions in terms of appearance and operation. Nearly all of the actions will affect characteristics of the lock and dam complex which have been the subject of previous rehabilitation projects.

We request your comments on this project at your earliest convenience. Any concerns you might have will be covered during the next planning stage for inclusion in the Environmental Assessment scheduled for completion in August 1986. If you have any questions, please call Mr. Charles Smith at 309/788-6361, Ext. 349. Your comments may be sent to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

for James T. Schnarre
Acting Chief, Planning Division

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
ROCK ISLAND FIELD OFFICE (ES)
1830 Second Avenue, Second Floor
Rock Island, Illinois 61201

IN REPLY REFER TO:

Com: 309-793-5800
FTS: 386-5800

March 1, 1985

Colonel William C. Burns, Jr.
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Burns:

This is our planning aid letter for the Lock and Dam 22 proposed major rehabilitation plan, Mississippi River at Pike County, Illinois and Ralls County, Missouri. It has been prepared under the authority of and in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973, as amended, and in accordance with the Fish and Wildlife Service's Mitigation Policy.

By copy of this letter, we are requesting comments from the Illinois and Missouri Departments of Conservation. Our letter is based on aerial photography, information contained in the "Resources Inventory for the Upper Mississippi River" (Peterson 1984), and information provided by your staff.

Description of the Project

The rehabilitation is proposed for the Lock and Dam 22 structure, Mississippi River Mile 301.2. The work includes repair of the overflow dike, repair and maintenance work on the tainter and roller gates and on the lock walls and miter gates, extension of the upper and lower guidewalls, and addition of four guard cells upstream of the intermediate wall. Included in the work is: (1) clearing the vegetation from the earthen dike section, (2) placement of riprap along the overflow section of the earthen dike to extend scour protection, (3) dredging silt from the auxilary lock to provide maintenance access, (4) soil-cementing the earthen dike on the Illinois side, (5) placing fill between the existing upstream approach dike and the proposed extended guidewall, and (6) extending the downstream guidewall 600 feet but leaving the area behind it open to recreational boaters.

Description of Fish and Wildlife Resources in the Project Area

Aquatic habitats above and below the dam are extremely valuable. No specific information is available for the pooled portion above Lock and Dam 22. Some sportfishing and commercial fishing does occur. The tailwaters, below the dam, have an important sportfishery for channel catfish, white bass, and

freshwater drum. The majority of sportfishing is by boat; however, a significant number of fishermen fish from the earthen dikes of the dam. The main channel border and side channel at Cottel Island are important commercial fishing sites. There has been no benthos sampling immediately above or below the dam. Recreational boating access is provided by a boat ramp just off the lower guidewall.

A significant mussel bed is found along the right bank between river miles 299.8 and 301.8. Several valves of the endangered Potamilus capax have been found on the downstream tip of Cottel Island (Ecological Analysts 1981). Terrestrial habitat in the project area is limited to the earthen dam and the backwater complexes below the dam. The earthen dam is primarily grasses and forbs that are mowed periodically. Except for use as a travel lane for furbearers, deer, and small mammals, the dam provides minimal wildlife habitat value. On the other hand, the backwater complex below the dam is important bottomland hardwood habitat. Endangered bald eagles use the mature trees for day perches and feed in the tailwaters.

Endangered Species

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal Agencies are required to obtain information from the Fish and Wildlife Service concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. Therefore, we are furnishing you the following list of species which may be present in the concerned area:

Classification	Common Name	Scientific Name	Habitat
Endangered	Gray Bat	Myotis grisescens	Caves
Endangered	Indiana Bat	Myotis sodalis	Caves & Riparian
Endangered	Bald Eagle	Haliaeetus leucocephalus	Breeding Wintering
Endangered	Higgin's Eye Pearly Mussel	Lampsilis higginsi	Rivers
Endangered	Fat Pocketbook Pearly Mussel	Potamilus capax	Rivers

In accordance with Section 7(c) of the Endangered Species Act of 1973, as amended, the Federal agency responsible for actions authorized, funded, or carried out in furtherance of a construction project that significantly affects the quality of the human environment, is required to conduct a biological assessment. The purpose of the assessment is to identify listed or proposed species likely to be adversely affected by their action and to assist the Federal agency in making a decision as to whether they should initiate consultation.

Section 7(d) of the 1978 Amendment to the Endangered Species Act underscores the requirement that the Federal Agency and the permit or license applicant shall not make any irreversible or irretrievable commitment of resources

during the consultation period which in effect would deny the formulation or implementation of reasonable alternatives regarding their actions on any endangered or threatened species.

The bald eagle feeds in the tailwaters of the dams on the Upper Mississppi River during winter. Large trees adjacent to the tailwaters are used as day perches between roosting areas and feeding flights. As discussed above several valves of the fat pocketbook pearly mussel have been found along Cottel Island. No Higgin's eye pearly mussels, gray bats, or Indiana bats have been documented in the immediate project area. However, it is possible that the two bat species forage in the project area as both species have been documented in Ralls County (R.K. Laval, personal communication). There is no designated critical habitat in the project area at this time.

State Protected Species

The following species have been identified as threatened or endangered by the States of Missouri and Illinois. Information is based on documentation in each county.

Species	Scientific Name	Missouri	Illinois
Bald eagle	Haliaeetus leucocephalus	rare	-
Gray bat	Myotis grisescens	endangered	endangered
Indiana bat	Myotis sodalis	-	endangered
Yellow mudturtle	Kinosternon flavescens	rare	-
Smooth green snake	Opheodrys vernalis	rare	-
Massasauga	Sistrurus catenatus	rare	-
Rock pocketbook	Arcidens confragosus	endangered	-
Hickory nut	Obovaria olivaria	rare	-
Fat pocketbook	Potamilus capax	endangered	-
Warty-back	Quadrula nodulata	rare	-
Lake sturgeon	Acipenser fulvescens	endangered	-
Burbot	Lota lota	rare	-
Ditch grass	Ruppia maritima	rare	-
Small spike-rush	Eleocharis parvula	rare	-
Wild sarsaparilla	Aralia nudicaulis	rare	-
Salt meadow grass	Leptochloa panicoides	-	endangered
Jeweled shooting star	Dodecatheon amethystinum	-	endangered
Grass-leaved lily	Stenanthium gramineum	-	threatened
Green trillium	Trillium viride	-	threatened
Ginseng	Panax quinquefolius	-	threatened
Narrow-leaved green milkweed	Asclepias stenophylla	-	threatened
Golden seal	Hydrastis canadensis	-	threatened

Impacts to Fish and Wildlife Resources

It is our understanding that only grasses and forbs will be removed from the earthen dike on the Illinois section and replaced with a soil-cement mixture. No trees or shrubs are to be removed. This will result in loss of the grass/forb habitat, but will not significantly impact fish and wildlife resources.

Placement of riprap at the scour hole along the overflow section of the earth dike will result in temporary loss of benthos that should recolonize in a short period of time. The value of this riprap to aquatic resources will depend on the size of rock used. The highest value will come from using rock that is 3 to 4 feet in diameter or greater. In studies of riprap in Pool 24, the Missouri Department of Conservation (G. Farabee, personal communication) has found increased relative abundance of fish at sites with riprap at least 3-1/2 feet in diameter. Smaller riprap produces similar species diversity but less numbers of fish.

Up to 12,000 cubic yards of sediment is to be removed from the auxiliary lock chamber. The material is likely all silt. Dredging of these sediments may affect aquatic resources if the sediment is polluted. Resuspension or disposal of polluted sediments could affect valuable aquatic resources. No disposal site alternatives have been identified by the District. We recommend that the material be removed with a mechanical dredge, barged to the Saverton channel maintenance disposal site (RM 302.5R) and used to revegetate this sand disposal site. This alternative has been previously recommended to the District by the interagency On Site Inspection Team. An unknown quantity of fill will be required to backfill the upper guidewall extension. This will result in a permanent loss of main channel border habitat. However, due to the location of this fill, it is expected that impacts will be minimal. Similar impacts will occur from extension of the lower guidewall and placement of the mooring cells.

As discussed in our letter of February 28, 1985, we are concerned about the possible cummulative impacts of these rehabilitation projects on expanding the navigation capacity of the Upper Mississippi River. Due to lack of information from your staff, we are unable to estimate the potential impact to fish and wildlife from this possible increase in capacity. Therefore, the Fish and Wildlife Service objects to the inclusion of the extension of the upper and lower guidewalls and the addition of four guard cells upstream of the intermediate wall.

Mitigation

In accordance with the Service Mitigation Policy (46 FR 7644-7655), we have evaluated the habitats to be impacted by the proposed project to determine their Resource Categories and proper Mitigation Goals. The Resource Categories and their Mitigation Goals are as follows:

Resource Category 1 - habitat is of high value and is unique and irreplaceable in the nation or ecoregion. Goal - no loss of existing habitat value. Guideline - the Service will recommend that all losses of existing habitat be prevented as these one-of-kind areas cannot be replaced. Insignificant changes are acceptable provided they will have no cumulative impact.

Resource Category 2 - habitat is of high value and is relatively scarce or becoming scarce in the nation or ecoregion. Goal - no net loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified or eliminated over time can be compensated by replacement with the same kind of habitat so that the total or net loss is zero.

Resource Category 3 - habitat is of high to medium value and is relatively abundant in the nation. Goal - no net loss of habitat value while minimizing loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified, eliminated over time or compensated by in-kind replacement can be compensated by replacement with other habitat types so that the total or net loss is zero.

Resource Category 4 - habitat is of medium to low quality. Goal - minimize loss of habitat value. Guideline - the Service will make recommendations to avoid, minimize, rectify or eliminate losses over time depending on the significance of the potential loss. Such areas are good candidates for mitigation of Resource Category 2 and 3 losses by management or enhancement to increase their habitat value.

We have assigned Resource Category 2 to all aquatic habitats to be impacted except the lock chamber, Category 2 to all bottomland hardwood habitat, and Resource Category 4 to the mowed area of the earthen dike and the auxilary lock chamber. The impacts from the proposed project can be adequately mitigated by avoiding all losses of bottomland hardwood habitat, using riprap 3 to 4 feet in diameter, avoiding any habitat losses at the dredged material disposal site, and using plants of high wildlife food value for any revegetation.

Recommendations

Based on this analysis, we have the following recommendations for further planning for the the proposed project:

1. Remove the extensions of the upper and lower guidewalls and addition of the four guide cells from the proposed plan.

2. No bottomland hardwoods be cleared.

3. All submerged riprap be 3 to 4 feet in diameter or greater.

4. Resurfacing of the earthen dike be done in such a manner as to not prevent fishermen access.

5. Means be investigated to improve walk-in fishing access.

6. A more accurate estimate of the dredging requirements at the auxilary lock be obtained.

7. A composite analysis of the sediments in the auxilary lock chamber be performed to determine organic and metal content.

8. Assuming no significant pollutants in the sediments, dredged material should be barged to the Saverton disposal site and revegetated with native grasses.

9. An analysis of the possible increases in navigation capacity be done.

This project also offers several opportunities for enhancement of fish and wildlife resources that we would like to discuss with you further. Some suggestions are:

1. Improve shoreline habitat with rock in the Illinois tailwaters.

2. Improving shallow water habitat above the dam.

We look forward to coordinating with you in developing the detailed design of this rehabilitation project. If you have any questions, contact Gail Peterson of this office.

Sincerely,

Thomas M. Groutage

Thomas M. Groutage
Field Supervisor

cc: IL DOC (Lutz, Bertrand, Cochran & McClain)
IL EPA (Yurdin)
MO DOC (Dieffenbach, Farabee)
U.S. EPA (Kansas City & Chicago)

Literature Cited

Ecological Analysts. 1981. Survey of freshwater mussels (Pelecypoda: Unionacea) at selected sites in Pools 11 through 24 of the Mississippi River. Prepared for U.S. Army Corps of Engineers, Rock Island District. Ecological Analysts, Inc., Northbrook, IL. 188pp.

Farabee, G. Personal communication. Missouri Dept. of Conservation, RR #1, Box 55, Palmyra, MO 63461.

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Peterson, G.A. ed. Resources Inventory for the Upper Mississippi River, Guttenberg, Iowa to Saverton, Missouri. Prepared for U.S. Army Corps of Engineers, Rock Island District, Rock Island, Illinois, under Letter Order No. NCR-LO-83-C9. U.S. Fish and Wildlife Service, Rock Island, IL 136pp.

MISSOURI DEPARTMENT OF CONSERVATION

MAILING ADDRESS:
P.O. Box 180
Jefferson City, Missouri 65102-0180

STREET LOCATION:
2901 West Truman Boulevard
Jefferson City, Missouri

Telephone 314/751-4115
LARRY R. GALE, Director

March 11, 1985

Colonel William C. Burns, Jr.
District Engineer
Rock Island District, Corps of Engineers
Clock Tower Building
Rock Island, Illinois 61201

Dear Colonel Burns:

We reviewed a copy of Mr. Thomas M. Groutage's February 28, 1985 and March 1, 1985 letters to you concerning rehabilitation work planned for locks and dams on the Mississippi River in Missouri. We are particularly concerned that we became aware of this work only after receiving a copy of the U.S. Fish and Wildlife Service's comments on this matter. As the state agency charged with management and control of fish, wildlife and forest resources, and an active cooperator with your agency on numerous areas of mutual interest, we were quite surprised that we were not informed of your planning activities.

We are concerned that this activity will result in increased navigation capacity, without Congressional authority. Such expansions, as discussed in the Upper Mississippi River Master Plan, would have long term adverse impacts on the river ecosystem.

Members of my staff are in the process of evaluating the U.S. Fish and Wildlife Service planning aid letter on work proposed for Lock and Dam 22. We will offer comments on that letter in the next few weeks. In the interim, we request that you send us copies of plans for work on Lock and Dam 22, 21 and 20.

Sincerely,

Larry R. Gale

LARRY R. GALE
DIRECTOR

cc: Mr. Thomas Groutage
U.S. Fish and Wildlife Service

Mr. Michael Witte
Illinois Department of Conservation

Illinois Department of Conservation
life and land together

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CHICAGO OFFICE - ROOM 100, 160 NORTH LASALLE 60601-3184

April 30, 1985

Mr. Thomas M. Groutage
Field Supervisor
USDI, FWS
Rock Island Field Office(ES)
1830 Second Avenue, Second Floor
Rock Island, Illinois 61201

RE: Miss. River
L&D 21 & 22
Major Rehab Plan

Dear Mr. TOM Groutage:

The Department has reviewed your planning aid letters for the above projects. As I relayed to you in our phone conversation on April 26, 1985, the Department has no additional comments on either of these projects at this time.

We support your recommendations for further planning of these projects. Thank you for the opportunity to comment.

Sincerely,

Richard W. Lutz

Richard W. Lutz, Supervisor
Impact Analysis Section

RWL:bp

MAY 2 1985

May 10, 1985

TRANSPORTATION
Waterways
Lock and Dam Rehabilitation
Comments

Colonel William C. Burns, Jr.
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building
P. O. Box 2004
Rock Island, Illinois 61204

Dear Colonel Burns:

The Missouri Highway and Transportation Department is pleased to hear that your District is presently evaluating necessary lock and dam rehabilitation work on the Mississippi River. This work can provide for the restoration of navigation capacity at the subject lock and dam structures.

Your District serves a significant role in the transportation of commodities on the Mississippi River. Through your District the waterway transportation industry provides benefits to shippers located in the Upper Mid-West. The reach of the Mississippi within your jurisdiction serves as a funnel through which these movements must pass. Further deterioration of these waterway structures serves only to reduce navigation capacity. Rehabilitation would increase traffic movements above present levels; however, we believe this does not represent an increase of navigation capacity as it applies to Public Law 95-502. Capacity which was lost as a result of structure deterioration needs to be restored.

The rehabilitation proposed by your District would also improve operational safety and efficiency in the vicinity of the structures. We suggest that it is highly questionable to continue to delay these needed safety and efficiency improvements.

We commend your District on the straight forward approach being used to address necessary rehabilitation work on the Mississippi River. The time has come to address the needs of waterway transportation and work toward providing adequate capacity to benefit shippers and industries within our region. Efficient transportation service is a necessary element in our nation's economic revitalization. Our Department looks forward to working with you and your staff in carrying out the necessary rehabilitation to restore navigation capacity on the Mississippi River.

Very truly yours,

Robert R. Hunter

Chief Engineer

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT. CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P O BOX 2004
ROCK ISLAND. ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

January 14, 1986

Planning Division

Mr. Richard C. Nelson
Field Supervisor
U.S. Fish and Wildlife Service
1830 Second Avenue, 2nd Floor
Rock Island, Illinois 61201

Dear Mr. Nelson:

This letter is in reference to proposed Major Rehabilitation Program work at Lock and Dam 21, Quincy, Illinois, and Lock and Dam 22, Saverton, Missouri.

To facilitate compliance with the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers, Rock Island District, requests information regarding federally listed threatened or endangered species found between approximate river miles 297 and 340, pools 23 to 21. Particular attention should be given to the immediate vicinity of each subject facility.

Information should include:

a. Potential or known occurrence of federally listed threatened or endangered species;

b. Presence of known critical habitat of federally listed threatened or endangered species;

c. General evaluation of effects from rehabilitation-related activities such as dredging and disposal, equipment movement, and seasonal timing of construction-type work; or

d. Recommendations for further study.

Please direct any questions to Mr. Bob Clevenstine of our Environmental Analysis Branch at 309/788-6361, Ext. 344, or write to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

Paul Scyphers

Dudley M. Hanson, P.E.
Acting Chief, Planning Division

Illinois Historic Preservation Agency
Old State Capitol • Springfield • 62701

January 24, 1986

Col. William C. Burns
District Engineer
Rock Island District, Corps of Engineers
Clock Tower Bldg., P.O. Box 2004
Rock Island, IL 61204-2004

Dear Col. Burns:

We have reviewed the draft report entitled Historical-Architectural and Engineering Study, Locks and Dams 11-22, Nine Foot Navigation Project, Mississippi River. This study provides a history of navigation projects on the Upper Mississippi River and a discussion of the significance of those locks and dams within the jurisdiction of the Rock Island District Corps of Engineers. It also proposes one complex as a good, representative example for nomination to the National Register of Historic Places and subsequent preservation.

Current preservation methodology requires the resource protection planning process to consist of several steps:

1. Definition of study unit or universe
2. Application of National Register criteria to elements within universe
3. Prioritization of character defining features
4. Formulation of treatment plan with reference to features within the context of the Secretary of the Interior's "Standards".

It will, therefore, be easiest to frame our comments with reference to these planning steps.

It appears that the appropriate study unit would be the entire Upper Mississippi River Nine Foot Navigation Project with an assigned period of significance of 1913-1940. This study, however, confines itself to that portion of the Project contained in a modern political boundary--the Rock Island Corps district. In order, therefore, for a complete, defensible application of the National Register criteria to the resources to be made, it would be necessary for the study to include the entire historical boundaries of the study unit. We recommend that the entire Project including the resources within the other Corps districts be studied prior to a formal National Register nomination.

The proposal to nominate one complex to the National Register for the purpose of applying the Standards only to that complex combines the identification and treatment plan steps in the preservation planning process. The identification of historic resources does not presuppose "embalming" them as a group or individually. It merely provides a logical framework for understanding the resources as an educational tool.

Once this is accomplished, character defining features of the project can be identified and the various complexes assessed for their individual degree of integrity utilizing these features. A treatment plan, in the form of a Process Memorandum of Agreement, can then be formulated, taking into account, also, current and projected navigation needs. It is quite possible that, at that time, the Illinois State Historic Preservation Office would agree to a rigorous application of the Secretary of the Interior's Standards for Rehabilitation at one complex and make realistic, liberal concessions to navigation needs at other complexes.

In the meantime, we understand that the Corps has immediate plans for a rehabilitation/expansion program at Lock and Dam Complexes 11-22. The Rock Island Corps has acted responsibly in fulfilling its responsibilities under Sections 106 and 110 of the National Historic Preservation Act of 1966. The failure of the other Corps Districts with Project complexes to act in a similar manner should not penalize the Rock Island District nor impede their program.

From the historical documentation presented in this study, however, we believe it is not premature to assume that the entire Project possesses sufficient regional (and, therefore, national) significance for National Register listing. It also appears that sufficient integrity exists at the complexes with the Rock Island District's jurisdiction for inclusion of these resources in a thematic resources nomination of the entire Project despite varying degrees of integrity from resource to resource.

We would, therefore, be willing to consider complexes 11-22 eligible for the National Register of Historic Places and enter into a Memorandum of Agreement for their rehabilitation. (This Memorandum of Agreement could later be amended to include a treatment plan for the remainder of Project complexes.) If this is amenable to the other SHPO's involved, we would be willing to meet and discuss the specific language for a draft document for submission to the Advisory Council on Historic Preservation.

If you have any questions, please call Anne M. Haaker at 217/785-4512.

Sincerely,

William G. Farrar

William G. Farrar
Deputy State Historic
Preservation Officer

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P O BOX 2004
ROCK ISLAND ILLINOIS 61204-2004

REPLY TO ATTENTION OF

January 28, 1986

Planning Division

Mr. William G. Farrar
Deputy Historic Preservation Officer
Illinois Historic Preservation Agency
Old State Capitol Building
Springfield, Illinois 62701

Dear Mr. Farrar:

We are currently formulating plans to rehabilitate the central control station at Lock and Dam 21 near Quincy, Illinois. This structure is part of the Nine-Foot Navigation Project for the Mississippi River. Extensive documentation can be found in the report entitled Mississippi River Locks and Dams 11-22 by Mary and Peter Rathbun (1984). As a result of this historical evaluation study, the central control station was assigned to Department of the Army preservation category IV, properties of little or no importance at this time. We intend to pursue the necessary rehabilitation for this structure as agreed upon at meetings held in October 1984 and June 1985. It was tentatively agreed that the central control station rehabilitation at Locks and Dams 17 and 22 would be held in abeyance or rehabilitated in accordance with the Secretary of the Interior's Standards while work at the remaining stations continued.

We have not received your comments on the Rathbun Associates report or on National Register and preservation issues; hence, we feel that exercising caution for the stations at Locks and Dams 17 and 22 will preserve representative examples for the future. We also have drafted a cultural resources overview for the rehabilitation program which addresses these topics and evaluates impacts. A draft Programmatic Memorandum of Agreement has been prepared as part of this package for locks and dams within our District. This package should be available for review in the near future. Because of tight schedules and funding requirements, we cannot delay this project any longer while all State Historic

Preservation Officers and the three Corps Districts complete the actions necessary for any system-wide agreements.

Overall, this project should have No Effect on the significance of the system, which is primarily based upon operational characteristics. Original drawings and photographs document the as-built condition. We propose to add new brick facing similar to other brick control stations. Windows and doors will be replaced and a new insulated roof will be installed. Interior improvements include a suspended ceiling and new lighting. A general plan drawing is enclosed for your review along with photocopied photographs.

We request your comments as soon as possible (within 30 days). If you have any questions, please call Mr. Charles Smith at 309/788-6361, Ext. 349. Your comments may be sent to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

James Schuerre
for Dudley M. Hanson, P.E.
Acting Chief, Planning Division

Enclosures

CONCUR

By: William C. Farrar
Deputy State Historic Preservation Officer

Date: 2/6/86

MISSOURI DEPARTMENT OF CONSERVATION

MAILING ADDRESS:
P.O. Box 180
Jefferson City, Missouri 65102-0180

STREET LOCATION:
2901 West Truman Boulevard
Jefferson City, Missouri

Telephone 314/751-4115
LARRY R. GALE, Director

February 3, 1986

Colonel William C. Burns
District Engineer
Rock Island District, Corps of Engineers
Clock Tower Building
Rock Island, Illinois 61201

Re: Planning Division
Lock and Dam 22 Rehabilitation

Dear Colonel Burns:

We have the January 14, 1986 letter from Mr. Dudley M. Hansen of your staff regarding the occurrences of endangered species in the vicinity of Mississippi River Lock and Dam 22. The attached list contains the scientific names of 26 state listed species that occur in Ralls County and is provided in response to Item a. While we are not aware of any designated critical habitat, we are concerned for aquatic and avian species that utilize or may occur in the immediate vicinity of the lock and dam. They are:

Bald eagle	Federal - Endangered
Gray bat	Federal - Endangered
Indiana bat	Federal - Endangered
Rock pocketbook mussel	State - Endangered
Hickory-nut mussel	State - Endangered
Fat pocketbook mussel	Federal - Endangered
Lake sturgeon	State - Endangered
Burbot	State - Rare

Recent records of occurrences are available for three mussel species. Specimens of the Hickory-nut mussel, Obovaria olivaria, state listed endangered, were collected in 1984 on a sandbar immediately below Lock and Dam No. 22. Sixteen other species of mussels were collected at this same location. Specimens of the Rock pocketbook mussel, Arcidens confragosus, state listed endangered, were collected in 1977 less than 1.5 miles downstream from Lock and Dam No. 22. Subfossil specimens of the Fat pocketbook mussel, Potamilus capax, federal and state listed endangered, were also collected in 1984 immediately below Lock and Dam 22.

In response to Items c and d of the January 14th letter, we offer two thoughts. First of all, we believe that to ascertain the presence or absence of endangered mussels, an intensive survey of the guidewalls extension area should be conducted. Because of anticipated disturbance from work around the lock and dam, it may be appropriate to avoid late winter when bald eagles are concentrated in the area.

We remain concerned for the expansion of navigation that may result from the proposed work on Mississippi River locks and dams. If you have questions or need additional information, please contact William H. Dieffenbach of my staff.

Sincerely,

Larry R. Gale

LARRY R. GALE
DIRECTOR

cc: U. S. Fish and Wildlife Service
Rock Island, Illinois

Illinois Department of Conservation
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CHICAGO OFFICE - ROOM 100, 160 NORTH LASALLE 60601-3184

February 11, 1986

Mr. Dudley M. Hanson, P.E.
Acting Chief, Planning Division
Department of the Army
Rock Island District, Corps of Engineers
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Re: Lock and Dam 22
Rehab Program

Dear Mr. Hanson:

Regarding your January 14 inquiry concerning state threatened and endangered species which may occur in the vicinity of Lock and Dam 22, I refer you to the information contained in the USFWS planning aid letter of March 1, 1985. This letter accurately portrays the status of these species relative to Lock and Dam 22.

Thank you for the opportunity to comment.

Sincerely,

Michael B. Witte
Director

RWL:bp

cc: USFWS Rock Island

Illinois Historic Preservation Agency
Old State Capitol • Springfield • 62701

May 20, 1986

District Engineer
U.S. Army Engineer District, Rock Island
Clock Tower Building -- P.O. Box 2004
Rock Island, IL 61204-2004

Attn: Mr.Dudley M. Hanson, Chief
Planning Division

Dear Mr. Hanson:

We have reviewed the Overview and Cultural Resources Compliance Report for the Major Rehabilitation Program for Mississippi River Locks and Dams 11 through 22.

In our opinion, this document adequately fulfills the requirements necessary for a Preliminary Case Report for purposes of 36 CFR part 800, "Protection of Historic and Cultural Properties."

We have also reviewed the Draft Process Memorandum of Agreement for the program. We suggest amending stipulation "g" to read "...specifications for actions under items b,c and e above." This will allow SHPO review of "no adverse effect" plans to insure adherence to the Secretary of the Interior's "Standards for Rehabilitation". Other than that, the PMOA is acceptable and we would agree to sign it.

If you have questions, please contact Anne M. Haaker at 217/785-4512.

Sincerely,

William G. Farrar

William G. Farrar
Deputy State Historic
Preservation Officer

WGF:AMH:ps

JOHN ASHCROFT
Governor

FREDERICK A. BRUNNER
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF PARKS, RECREATION, AND HISTORIC PRESERVATION
P.O. Box 176
Jefferson City, MO 65102
314-751-2479

June 18, 1986

Dudley M. Hanson
Chief, Planning Division
Department of the Army
Rock Island Corps of Engineers
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204-2004

Re: Proposed PMOA, Major Rehabilitation Program, Mississippi River Locks and Dams 11-22, Rock Island District

Dear Mr. Hanson:

In response to your letter dated 11 April 1986 concerning a draft Process Memorandum of Agreement (PMOA) for the major rehabilitation program proposed for Mississippi River Locks and Dams 11-22, properties potentially eligible for inclusion in the National Register of Historic Places, the Missouri Historic Preservation Program has the following comments:

1. A stipulation should be included which states that Rock Island District Corps of Engineers (NCR) will initiate, in conjunction with the St. Paul and St. Louis Corps Districts, a formal nomination of the Mississippi River Locks and Dams System to the National Register of Historic Places.

2. Stipulation h and i - coordination and consultation with the State Historic Preservation Officer (SHPO) should not be limited to Illinois. It is suggested that Missouri, Iowa and Wisconsin SHPOs also be included.

In general, we find the draft PMOA to be acceptable and we would be willing to be a signator of such an agreement.

If I can be of further assistance, please call 314/751-7958 or write.

Sincerely,

DIVISION OF PARKS, RECREATION,
AND HISTORIC PRESERVATION

Michael S. Weichman
Chief, Review and Compliance

MSW:ro

IOWA STATE HISTORICAL DEPARTMENT
OFFICE OF HISTORIC PRESERVATION

ADRIAN D. ANDERSON, Executive Director
STATE HISTORIC PRESERVATION OFFICER

June 24, 1986

Dudley M. Hanson, P.E.
Chief, Planning Division
U.S. Army Engineer District, Rock Island
Clock Tower Building-P.O. Box 2004
Rock Island, Illinois 61204-2004

RE: MAJOR REHABILITATION PROGRAM, MISSISSIPPI RIVER LOCKS AND DAMS 11 THROUGH 22 IN THE ROCK ISLAND DISTRICT: OVERVIEW AND CULTURAL RESOURCES COMPLIANCE REPORT WITH A PROCESS MEMORANDUM OF AGREEMENT

Dear Mr. Hanson:

We have completed our review of the above referenced report that you submitted to this office in late April. This document more than adequately meets the requirement for case reports and is a thorough and adequate summary of actions to date concerning Locks and Dams 11 through 22. We concur with your assessment that the majority of proposed rehabilitation activities will not adversely impact significant lock and dam characteristics, and that overall the project may prove beneficial. We also concur that the proposed Process Memorandum of Agreement (PMOA) provides for adequate protection of significant features of the system pursuant to Sections 106 and 110 of the National Historic Preservation Act and related regulations and guidelines. We do suggest two changes in that document, however. Stipulation b., which concerns activities impacting significant structures or features, should be revised to include SHPO participation and review. Stipulation g. should then be revised to reflect this as well.

If you have questions or concerns, please do not hesitate to contact me or Ralph Christian, our architectural historian, at 515/281-8697.

Sincerely.

David Crosson
State Historic Preservation Officer

cc: Michael Quinn, Advisory Council on Historic Preservation
Anne Haacker, Illinois SHPO
Michael Lipsman, Missouri SHPO
Chip Smith, Rock Island District, Army Corps of Engineers

United States Department of the Interior

FISH AND WILDLIFE SERVICE
ROCK ISLAND FIELD OFFICE (ES)
1830 Second Avenue, Second Floor
Rock Island, Illinois 61201

IN REPLY REFER TO:
COM: (309) 793-5800
FTS: 386-5800

July 29, 1986

Colonel William C. Burns Jr.
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Burns:

This is our final Fish and Wildlife Coordination Act Report for the Lock and Dam 22 proposed major rehabilitation plan, Mississippi River at Pike County, Illinois and Ralls County, Missouri. It has been prepared under the authority of and in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973, as amended, and in accordance with the Fish and Wildlife Service's Mitigation Policy.

By copy of this letter, we are requesting comments from the Illinois and Missouri Departments of Conservation. Comments from Illinois on our planning aid letter dated March 1, 1985 are attached. No specific comments were received from Missouri. Our letter is based on aerial photography, information contained in the "Resource Inventory for the Upper Mississippi River" (Peterson 1984), information contained the Reconnaissance Report dated February 1985, and Mr. Hansen's letter of June 14, 1986.

Description of the Project

Rehabilitation is proposed for the Lock and Dam 22 structure, Mississippi River mile 301.2. The work includes repair of the overflow dike; repair and maintenance of the tainter and roller gates, the lock walls and miter gates, and the auxilary lock miter gate and chamber; improvement and maintenance of lock and dam machinery; and addition of four guard cells upstream of the intermediate wall. Included in the work is: (1) clearing the vegetation from the earthen dike section, (2) placement of riprap along the overflow section of the earthen dike to extend scour protection, (3) dredging silt from the auxilary lock to provide maintenance access, (4) soil-cementing the earthen dike on the Illinois side, (5) riprapping the upstream approach dike, (6) filling for the sheetpile guard cells, and (7) installation of an air bubbler system.

Description of Fish and Wildlife Resources in the Project Area

Aquatic habitats above and below the dam are extremely valuable. No specific information is available for the pooled portion above Lock and Dam 22. Some

sportfishing and commercial fishing does occur. The tailwaters, below the dam, have an important sportfishery for channel catfish, white bass, and freshwater drum. The majority of sportfishing is by boat; however, a significant number of fishermen fish from the earthen dikes of the dam. The main channel border and side channel at Cottel Island are important commercial fishing sites. There has been no benthos sampling immediately above or below the dam. Recreational boating access is provided by a boat ramp just off the lower guidewall.

A significant mussel bed is found along the right bank between river miles 299.8 and 301.8. Several valves of the endangered Potamilus capax have been found on the downstream tip of Cottel Island (Ecological Analysts 1981). Terrestrial habitat in the project area is limited to the earthen dam and the backwater complexes below the dam. The earthen dam is primarily grasses and forbs that are mowed periodically. Except for use as a travel lane for furbearers, deer, and small mammals, the dam provides minimal wildlife habitat value. On the other hand, the backwater complex below the dam is important bottomland hardwood habitat. Endangered bald eagles use the mature trees for day perches and feed in the tailwaters.

Endangered Species

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal Agencies are required to obtain from the Fish and Wildlife Service information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. Therefore, we are furnishing you the following list of species which may be present in the concerned area:

Classification	Common Name	Scientific Name	Habitat
Endangered	Gray Bat	Myotis grisescens	Caves
Endangered	Indiana Bat	Myotis sodalis	Caves & Riparian
Endangered	Bald Eagle	Haliaeetus leucocephalus	Breeding Wintering
Endangered	Fat Pocketbook Pearly Mussel	Potamilus capax	Rivers

In accordance with Section 7(c) of the Endangered Species Act of 1973, as amended, the Federal agency responsible for actions authorized, funded, or carried out in furtherance of a construction project that significantly affects the quality of the human environment, is required to conduct a biological assessment. The purpose of the assessment is to identify listed or proposed species likely to be adversely affected by their action and to assist the Federal agency in making a decision as to whether they should initiate consultation.

Section 7(d) of the 1978 Amendment to the Endangered Species Act underscores the requirement that the Federal Agency and the permit or license applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which in effect would deny the formulation or

implementation of reasonable alternatives regarding their actions on any endangered or threatened species.

The bald eagle feeds in the tailwaters of the dams on the Upper Mississippi River during winter. Large trees adjacent to the tailwaters are used as day perches between roosting areas and feeding flights. As discussed above several valves of the fat pocketbook pearly mussel have been found along Cottel Island. No gray bats or Indiana bats have been documented in the immediate project area. However, it is possible that the two bat species forage in the project area as both species have been documented in Ralls County (R.K. Laval, personal communication). There is no designated critical habitat in the project area at this time.

State Protected Species

The following species have been identified as trheatened or endangered by the States of Missouri and Illinois. Information is based on documentation in each county.

Species	Scientific Name	Missouri	Illinois
Bald eagle	Haliaeetus leucocephalus	rare	-
Gray bat	Myotis grisescens	endangered	endangered
Indiana bat	Myotis sodalis	-	endangered
Yellow mudturtle	Kinosternon flavescens	rare	-
Smooth green snake	Opheodrys vernalis	rare	-
Massasauga	Sistrurus catenatus	rare	-
Rock pocketbook	Arcidens confragosus	endangered	-
Hickory nut	Obovaria olivaria	rare	-
Fat pocketbook	Potamilus capax	endangered	-
Warty-back	Quadrula nodulata	rare	-
Lake sturgeon	Acipenser fulvescens	endangered	-
Burbot	Lota lota	rare	-
Ditch grass	Ruppia maritima	rare	-
Small spike-rush	Eleocharis parvula	rare	-
Wild sarsaparilla	Aralia nudicaulis	rare	-
Salt meadow grass	Leptochloa panicoides	-	endangered
Jeweled shooting star	Dodecatheon amethystinum	-	endangered
Grass-leaved lily	Stenanthium gramineum	-	threatened
Green trillium	Trillium viride	-	threatened
Ginseng	Panax quinquefolius	-	threatened
Narrow-leaved green milweed	Asclepias stenophylla	-	threatened
Golden seal	Hydrastis canadensis	-	threatened

Impacts to Fish and Wildlife Resources

It is our understanding that only grasses and forbs will be removed from the earthen dike on the Illinois section and replaced with a soil-cement mixture. No trees or shrubs are to be removed. This will result in loss of the grass/forb habitat, but will not significantly impact fish and wildlife resources.

Placement of riprap at the scour hole along the overflow section of the earth dike will result in temporary loss of benthos that should recolonize in a

short period of time. The value of this riprap to aquatic resources will depend on the size of rock used. The highest value will come from using rock that is 3 to 4 feet in diameter or greater. In studies of riprap in Pool 24, the Missouri Department of Conservation (G. Farabee, personal communication) has found increased relative abundance of fish at sites with riprap at least 3-1/2 feet in diameter. Smaller riprap produces similar species diversity but lesser numbers of fish.

Up to 20,000 cubic yards of sediment is to be removed from the auxiliary lock chamber. The material is likely all silt. Dredging of these sediments may affect aquatic resources if the sediment is polluted. Resuspension or disposal of polluted sediments could affect valuable aquatic resources. No disposal site alternatives have been identified by the District. We recommend that the material be removed with a mechanical dredge, barged to the Saverton channel maintenance disposal site (RM 302.5R) and used to revegetate this sand disposal site. This alternative has been previously recommended to the District by the interagency On Site Inspection Team. In addition 3,000 cubic yards of rock and debris will be excavated from the main lock chamber. This material should be placed in and upland, non-wetland site.

An unknown quantity of fill will be required to backfill the upper guardwall. This will result in a permanent loss of main channel border habitat. However, due to the location of this fill, it is expected that impacts will be minimal.

As discussed in our letters of February 28, 1985 and October 22, 1985, we are concerned about the possible cumulative impacts of these rehabilitation projects on increasing the navigation traffic on the Upper Mississippi River. Due to lack of information from your staff, we are unable to estimate the potential impact to fish and wildlife from this possible increase in navigation capacity. Berger and Associates (1981) estimated that improvements to the upper approach at Lock and Dam 22 could increase capacity by almost 8%. We note that the Pool 22 mooring cell has been completed since that time. In addition, they estimate that expediting operations in ice conditions could increase capacity by 3%. The potential impacts to fish and wildlife may be significant. Therefore, the Fish and Wildlife Service objects to the inclusion of the upper guardwall and the air bubbler system.

Mitigation

In accordance with the U.S. Fish and Wildlife Service Mitigation Policy (46 FR 7644-7655), we have evaluated the habitats to be impacted by the proposed to determine their Resource Categories and proper Mitigation Goals. The Resource Categories and their Mitigation Goals are as follows:

> Resource Category 1 - habitat is of high value and is unique and irreplaceable in the nation or ecoregion. Goal - no loss of existing habitat value. Guideline - the Service will recommend that all losses of existing habitat be prevented as these one-of-kind areas cannot be replaced. Insignificant changes are acceptable provided they will have no cumulative impact.

Resource Category 2 - habitat is of high value and is relatively scarce or becoming scarce in the nation or ecoregion. Goal - no net loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified or eliminated over time can be compensated by replacement with the same kind of habitat so that the total or net loss is zero.

Resource Category 3 - habitat is of high to medium value and is relatively abundant in the nation. Goal - no net loss of habitat value while minimizing loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified, eliminated over time or compensated by in-kind replacement can be compensated by replacement with other habitat types so that the total or net loss is zero.

Resource Category 4 - habitat is of medium to low quality. Goal - minimize loss of habitat value. Guideline - the Service will make recommendations to avoid, minimize, rectify or eliminate losses over time depending on the significance of the potential loss. Such areas are good candidates for mitigation of Resource Category 2 and 3 losses by management or enhancement to increase their habitat value.

We have assigned Resource Category 2 to all aquatic habitats to be impacted except the lock chamber, and to all bottomland hardwood habitat, and Resource Category 4 to the mowed area of the earthen dike and the auxilary lock chamber. The site specific impacts from the proposed project can be adequately mitigated by avoiding all losses of bottomland hardwood habitat, using riprap 3 to 4 feet in diameter, avoiding any habitat losses at the dredged material disposal sites, and using plants of high wildlife food value for any revegetation. Cumulative impacts may be avoided by eliminating the guardwalls and air bubbler system from the proposed plan.

Recommendations

Based on this analysis, we have the following recommendation for further planning for the proposed project:

1. Remove the upper guardwall and air bubbler from the proposed plan.

2. No bottomland hardwoods be cleared.

3. All submerged riprap be 3 to 4 feet in diameter or greater.

4. Resurfacing of the earthen dike be done in such a manner as to not prevent fishermen access.

5. Means be investigated to improve walk-in fishing access.

6. Rock and debris from the main lock chamber be disposed in an upland non-wetland location.

7. A composite analysis of the sediments in the auxilary lock chamber be performed to determine organic and metal content.

8. Assuming no significant pollutants in the sediments, dredged

material should be barged to the Saverton disposal site and revegetated with native grasses.

9. An analysis of the possible increases in navigation traffic be done (see our letter of April 7, 1986). This should be a cumulative assessment and should include all proposed rehabilitation work and the Second Lock proposed for Lock and Dam 26(R).

This project also offers several opportunities for enhancement of fish and wildlif resources that we would like to discuss with you further. Some suggestions are:

1. Improve shoreline habitat with rock in the Illinois tailwaters.

2. Improve shallow water habitat above the dam.

We are discouraged that we still find it necessary to address rehabilitation measures that will affect navigation capacity. We urge you to initiate the scoping process for the cumulative impact assessment as soon as possible, so that we can continue to move toward resolution of this issue. If you have any questions, contact Gail Carmody or me.

Sincerely,

Richard C. Nelson
Field Supervisor

Enclosure

cc: IL DOC (Lutz, Bertrand, Cochran & McClain)
IL EPA (Yurdin)
MO DOC (Dieffenbach, Farabee)
U.S. EPA (Kansas City & Chicago)

Literature Cited

Berger and Associates. 1981. Inventory of potential structural and non-structural alternatives for increasing navigation capacity-upper Mississippi river system. Prepared for UMRBC. East Orange, N.J. Various pagings.

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MISSOURI DEPARTMENT OF CONSERVATION

MAILING ADDRESS:
P.O. Box 180
Jefferson City, Missouri 65102-0180

STREET LOCATION:
2901 West Truman Boulevard
Jefferson City, Missouri

Telephone 314/751-4115
LARRY R. GALE, Director

August 26, 1986

Mr. Richard C. Nelson
Field Supervisor
U. S. Fish and Wildlife Service
1830 Second Ave.
Rock Island, Illinois 61201

Dear Mr. Nelson:

Thank you for the opportunity to review the final Fish and Wildlife Coordination Act Report for the rehabilitation of Lock and Dam 22, Ralls County, Missouri. Members of my staff reviewed the July 29, 1986 report and we concur in your recommendations.

As stated in my March 11, 1985 letter to Colonel William C. Burns, Jr., we are concerned by the potential increase in navigation capacity without Congressional authority. In addition, my July 25, 1986 letter to Dr. Frederick A. Brunner, Director, Missouri Department of Natural Resources, expressed our concern for navigation expansion through the installation of guidewall extensions and air bubbler systems designed for ice management at Mississippi River locks and dam.

Again, thank you for the opportunity to review the report. If you have questions, please contact William H. Dieffenbach of my staff.

Sincerely,

LARRY R. GALE
DIRECTOR

cc: Colonel William C. Burns, Jr.
District Engineer
Rock Island District, Corps of Engineers

Michael Witte
Illinois Department of Conservation

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P O BOX 2004
ROCK ISLAND ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

December 5, 1986

Planning Division

Mr. Richard Nelson
Field Supervisor
U.S. Fish and Wildlife Service
1830 Second Avenue, Second Floor
Rock Island, Illinois 61201

Dear Mr. Nelson:

The District has completed an analysis to determine the impacts to navigation traffic resulting from construction of a lower guard cell at Lock and Dam 21, as dicussed during our meeting on November 25, 1986. Enclosed for your review and comment is an appendix describing the analysis, which concludes that the lower guard cell at Lock and Dam 21 will have no immediate or long-term impact on the level of traffic transiting the lock, nor will it increase the ability of the lock to accommodate additional traffic.

We also indicated at the November 25, 1986, meeting that an analysis concerning the proposed guardwall at Lock and Dam 22 would be forthcoming for your review. Since that meeting, the District has determined that the guardwall could not be constructed at Lock and Dam 22 unless there was also an upper guidewall extension. Therefore, we are removing the guardwall from the site-specific Environmental Assessment, and will include this feature in the NEPA Document being prepared to assess the potential for increases in navigation traffic and cumulative impacts.

We would appreciate your comments on the analysis and our conclusions as soon as possible. Please call Mr. Ken Younker of our Economic and Social Analysis Branch at 309/788-6361, Ext. 394, or Ms. Karen Bahus of our Environmental Analysis Branch at Ext. 384, should you have any questions on our analysis.

Please send your comments to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

ORIGINAL SIGNED BY

Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosure

EVALUATION OF IMPACTS TO NAVIGATION RESULTING FROM CONSTRUCTION OF LOWER GUARD CELL AT LOCK AND DAM 21

General

The proposed rehabilitation of Lock and Dam 21 includes construction of a sheet pile guard cell to be located approximately 100-125 feet downstream of the lower intermediate lock wall (the wall separating the main and emergency chambers). Construction of the cell is proposed primarily as a safety feature to assure that upbound tows are better aligned for chamber entry. The presence of the guard cell will force the head of the tow within the cell thereby enhancing a proper final approach. Benefits to be derived through construction of this cell result from reduced damage to the miter gates and adjacent areas caused by improperly aligned tows striking the gates.

Although proposed as a safety feature, questions have been raised as to the potential for this feature to reduce upbound average approach times at the lock and subsequently enhance the ability of the lock to accommodate traffic and/or increase the level of traffic desiring to use the lock. This analysis evaluates the potential of such gains in traffic or lock efficiency.

In a 1981 report, Louis Berger & Associates (LBA) 1/ indicated that various improvements to approaches at selected locks and dams on the Upper Mississippi River could possibly provide increased operating efficiency at these locks. Among these improvements were extension of the landside guidewalls and installation of guard cells angled towards the center of the river from the upstream end of the river wall. The LBA report indicated that extension of the guidewalls at Lock and Dam 21 could possibly result in reduced approach times of 2-4 minutes. The report failed to identify or quantify any potential increases in operating efficiency accruing from construction of the guard cells angled upstream of the river guard wall.

The LBA report also failed to identify or quantify any potential efficiency increases resulting from construction of an individual guard cell, such as that proposed at Lock and Dam 21. Since both its design and location are dissimilar from other proposals included in the Berger report, any gains in efficiency such as those possibly accruing from extended guidewalls, cannot be inferred to accrue through construction of the guard cell at Lock and Dam 21.

1/ Inventory of Potential Structural and Non-Structural Alternatives for Increasing Navigation Capacity-Upper Mississippi River Master Plan, Louis Berger & Associates, 1981.

Methodology

The methodology used to evaluate the impacts to navigation resulting from construction of the cell at Lock and Dam 21 consists of comparing lock performance statistics under a "with project" and "without project" condition at an adjacent lock. A similar guard cell was constructed downstream of the lower intermediate lock wall in September, 1983 at Lock and Dam 22, located 24 miles downstream of the project site. It is believed that a guard cell at Lock and Dam 21 will provide similar benefits to the cell located at Lock and Dam 22. However, because the outdraft problem in the lower pool at Lock and Dam 22 is considered more hazardous than that of Lock and Dam 21, this comparison should provide a measure of the upper limit of benefits that may be accrued at Lock and Dam 21.

Performance monitoring system (PMS) data for years 1982 and 1984 were used to compare performance statistics for upbound tows approaching Lock 22 under conditions with the guard cell (1984) and without the guard cell (1982). PMS data permits analysis of various components of the lockage process including approach time. In addition, PMS data provides statistics regarding three different types of approaches: fly, exchange, and turnback. A fly approach occurs when the lock has been idle and the inbound vessel directly enters the chamber. An exchange approach occurs when the vessel inbound to the chamber passes a vessel outbound from the chamber. A turnback approach occurs when the preceding event is a lockage where no tows were served. For this analysis, only fly approach times were utilized. Times of exchange approaches were not considered because these times are a function of the point where the two oncoming tows pass and may vary with each approach. Similarly, turnback approach times were not utilized, as awaiting tows are usually moored at a point on the lower guidewall where the guard cell is of little assistance in chamber entry. Utilization of upbound approach times resulted in a sample size of at least 10 percent of the 5,409 and 5,718 commercial lockages that occurred in 1982 and 1984, respectively.

Further analysis was conducted regarding the potential increase in safety accruing from construction of the guard cell. This analysis consisted of comparing accident records pertaining to upbound approaching tows for 1982 and 1984 at Lock and Dam 22 under conditions with and without the cell in place.

Findings

Comparison of upbound approach times between 1982 (without guard cell) and 1984 (with guard cell in place) yielded no difference in average approach times. For both years, average upbound fly approach times were identical-28 minutes. During 1982, prior to construction of the cell at Lock and Dam 22, there were 6 accidents at the lock involving upbound approaching tows. During 1984, following construction of the cell, only one such accident occurred.

Conclusions

FMS data does not indicate a difference in average approach times of upbound tows at Lock and Dam 22 prior to construction of the guard cell or afterward. As a result, it can be concluded that construction of a guard cell at Lock and Dam 21 will have no immediate or longterm impact on the level of traffic transiting the lock, nor will it increase the ability of the lock to accommodate additional traffic. With construction of the guard cell, however, an extra margin of safety will be provided at the lock. Increased safety translates to reduced government and private property damage, as well as reduced exposure to possible barge spills which may have negative environmental impacts.

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P O BOX 2004
ROCK ISLAND ILLINOIS 61204 2004

REPLY TO
ATTENTION OF

January 14, 1987

Planning Division

Mr. William Dieffenbach
Planning Department
Missouri Department of Conservation
609 Belmont
Jefferson City, Missouri 65101

Dear Mr. Dieffenbach:

The Rock Island District is currently planning work for the rehabilitation of Lock and Dam 22 at Saverton, Missouri. As of this date, the District considers the use of a previous disposal site, RM 302.5, to be the most advantageous alternative for disposal of fine sediments excavated at the lock and dam, as well as for some coarse debris from concrete work during the project. Previous uses of this site (GREAT 22.37) were coordinated with Missouri State agencies during the GREAT II processes, and will continue through OSIT interagency action.

The plan, as presently perceived, involves mechanical dredging of materials and barge transport to the site. Following disposal activities, the site will be graded and seeded to control erosion and provide wildlife benefits. However, future use of this site for other channel maintenance disposal is anticipated. This may eliminate wildlife benefits realized from silt disposal over the entire site. Rock Island District will consider the State's recommendations for site preparation, i.e., spot piling of dredged material versus uniform grading, should you consider such preparation advantageous. No containment of dredged material will be necessary due to dredging methodology; therefore, no return water is anticipated from disposed materials. The District also requests your comments and suggestions as to seeding or planting the area for inclusion in further project planning (reference the enclosed aerial photograph).

The site currently consists of several acres of bare sand ringed by willow saplings, box elder, and silver maple. By February 1987, an Environmental Assessment and Section 404(b)(1) Evaluation will be distributed for public and agency review regarding the proposed project. At that time, your agency will have further opportunity for review and comment.

Should you have any questions regarding the rehabilitation of Lock and Dam 22, please call Mr. Rob Clevenstine of our Environmental Analysis Branch at 309/788-6361, Ext. 344, or write to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

Signed By
J. T. SCHNERRE

Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosure

Copy Furnished:

Frederick A. Brunner, Ph.D.
Director
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102 wo/enclosure

MISSOURI DEPARTMENT OF CONSERVATION

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STREET LOCATION:
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Jefferson City, Missouri

Telephone 314/751-4115
LARRY R. GALE, Director

50 YEARS of CONSERVATION
1937 • 1987

February 4, 1987

Mr. Dudley M. Hanson
Chief, Planning Division
Rock Island District, Corps of Engineers
Clock Tower Building
P. O. Box 2004
Rock Island, Illinois 61204-2004

Dear Mr. Hanson:

Thank you for your January 14, 1987 letter concerning the placement of fine sediment and coarse material on dredge site 22.37, Mississippi River Mile 302.5. Based on our knowledge of the site and dredging activities in the Saverton reach, I concur with the use of the fine material as a cover for the existing sandy disposal site.

As noted in your letter, the silt will likely speed the vegetation of the site. It would be our recommendation that once the present dredge material is revegetated, no more material should be placed on this site. We would hope that rock work placed in the Saverton reach will preclude the need for additional navigation channel dredging. If dredging becomes necessary, a site either upstream or downstream of the revegetated site could be activated.

I look forward to receiving a copy of the environmental assessment when it is available for review.

Sincerely,

W. H. Dieffenbach

WILLIAM H. DIEFFENBACH
ENVIRONMENTAL SERVICES SUPERVISOR

WHD:jct
cc: Department of Natural Resources
Division of Environmental Quality

U. S. Fish and Wildlife Service
Rock Island, Illinois

JOHN ASHCROFT
Governor

FREDERICK A. BRUNNER
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE DIRECTOR
P.O. Box 176
Jefferson City, Missouri 65102
Telephone 314-751-4422

February 19, 1987

Mr. Dudley M. Hanson, Chief
Planning Division, Department of the Army
Rock Island District Corps of Engineers
P.O. Box 2004
Rock Island, Illinois 61204-2004

RE: Proposed Dredged Material Disposal Project (COE), Lock and Dam 22, Saverton, Ralls County, Missouri

Dear Mr. Hanson:

In response to your letter dated 13 February 1987 concerning the above referenced project, the Historic Preservation Program has reviewed the information provided and has determined that the proposed undertaking should have no effect on any property determined eligible for inclusion in, or listed on, the National Register of Historic Places. Therefore, it is the opinion of this office that a cultural resource assessment would not be warranted and we have no objections to the initiation of project activities.

However, if the currently defined project area or scope of project-related activities is changed or revised, or cultural materials are encountered during construction, the Missouri Historic Preservation Program must be notified and appropriate information relevant to such changes, revisions, or discoveries be provided for further review and comment, in order to ascertain the need for additional investigations.

If I can be of further assistance, please write or call (314)751-7958.

Sincerely,

DIVISION OF PARKS, RECREATION,
AND HISTORIC PRESERVATION

Michael S. Weichman
Senior Archaeologist

MSW:jh

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

ATTACHMENT 3 of 4

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P O BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF
NCRPD-E

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION
FOR
LOCK AND DAM 22 MAJOR REHABILITATION
RALLS COUNTY, MISSOURI, AND PIKE COUNTY, ILLINOIS

FEBRUARY 1987

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION
FOR
LOCK AND DAM 22 MAJOR REHABILITATION
RALLS COUNTY, MISSOURI, AND PIKE COUNTY, ILLINOIS

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CLEAN WATER ACT
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FOR
LOCK AND DAM 22 MAJOR REHABILITATION
RALLS COUNTY, MISSOURI, AND PIKE COUNTY, ILLINOIS

SECTION 1 - PROJECT DESCRIPTION

LOCATION

Lock and Dam 22 is located at river mile 301.2, spanning the Mississippi below Saverton, Missouri, to the Illinois shore. The lock facility is located on the right descending bank and consists of one 600-foot main lock separated from the dam by an emergency/auxiliary set of lock miter gates. Adjacent counties are Ralls, in Missouri, and Pike, in Illinois. The project location is shown on Plate 1 - Project Location.

GENERAL DESCRIPTION

A. As a component of major rehabilitation of the lock and dam facility, it is proposed to dredge material from the upstream and downstream sides of the emergency/auxiliary miter gates. The purpose of this dredging is to allow removal of the gate leaves for repair.

B. It is also proposed to place fill material, in the form of riprap bank protection, at various points around the project area.

C. Up to 3,000 cubic yards of rock debris, washed into the main lock chamber by river currents and towboat propwash, may be placed along suitable bottom contours to provide improved aquatic habitat near the Illinois shore. This action depends on potential equipment access and suitable substrate.

No dredging is currently anticipated for bank protection work.

AUTHORITY AND PURPOSE

The project is to be implemented under the authority of the River and Harbor Act of 3 July 1930, which authorized the Upper Mississippi River Nine-Foot Channel Navigation Project. Operation and maintenance of Lock and Dam 22 is included in that authorization.

The purpose of the project is major rehabilitation of an existing facility, which is a component of the Upper Mississippi River Nine Foot Channel Navigation Project. Lock and Dam 22 is a unit of the Inland Waterway Navigation System of the Upper Mississippi River Basin.

GENERAL DESCRIPTION OF DREDGED AND FILL MATERIAL TO BE PLACED BELOW THE ORDINARY HIGH WATER MARKS

Approximately 20,200 yd^3 of silt will be removed adjacent to the auxiliary lock gates and placed in an approved spoil site.

The upper approach dike will be repaired by placing approximately 2,300 yd^3 of riprap along the riverside slope to abate current erosion problems.

The overflow section will be covered with a 6-inch layer of reinforced concrete totaling approximately 600 yd^3. In addition, approximately 1,000 yd^3 of riprap and grout will be placed on the overflow section to abate current erosion problems.

Material to be used for bank protection and overflow dam repair will consist of riprap and slush concrete. Rock typically used for riprap and fill is limestone and, as such, may be considered physically stable and chemically noncontaminating. Stone gradations are shown on table 1 below, and quantity estimates are shown on table 2.

TABLE 1

Stone Gradations

Percent Smaller by Weight	Limits of Weights of Stone (lbs.)
	Riprap
100	2,000-950
50	830-460
15	400-200

TABLE 2

Quantity Estimates (yd^3)

Material	Approach Dike	Overflow Dam	Approx. Total
Riprap	2,300	1,000	3,300
Concrete	0	600	600

DESCRIPTION OF PROPOSED DISCHARGE SITES

The location of Lock and Dam 22 is indicated on Plate 1 - Project Location. Plans and profiles of construction/repair areas are provided on plate 2. One dredged material disposal site is proposed for this project and is indicated on plate 3. This area is considered an upland site and consists of bare sand, previously deposited from other dredging events. Material will be moved to the site by barge and spread by bulldozer or by hydraulic dredging. Following spreading, revegetation will be initiated by seeding with native, moist-soil grasses.

It is currently proposed to deposit approximately 3,000 yd^3 of rock debris from the main lock chamber along suitable bottom contours near the Illinois shore to provide aquatic habitat improvement. This rock has been washed into the lock chamber by river currents and towboat propwash. Disposal in this manner is contingent on equipment access to suitable sites. Site suitability will be determined by bathymetric information review and concurrence of Federal and State natural resource agency staffs. If this disposal is not feasible, rock debris will be incorporated into other proposed riprap work. Substrates throughout the upstream and downstream areas away from the dam are typically fine silts and clays.

Discharge of riprap bank protection and slush concrete will occur on existing similar structures and materials. Most rock placed on the upper approach dike will be above the ordinary high water mark, as will most concrete. These areas currently exhibit some colonization by terrestrial plant species above water and filamentous algae and aquatic insects below.

DESCRIPTION OF DISPOSAL METHOD

Placement of material for bank/dam repair typically involves the use of deck-mounted cranes and/or derricks, deck barges, endloaders, quarter boats, and tender craft. Materials are dumped to alignment and spread to profile. Large grade stone (i.e., derrick stone) is placed by crane or derrick. Disposal of finer material from the auxiliary lock area will primarily involve the use of similar equipment, or by use of hydraulic dredging equipment whereby the material will be pumped to the disposal site. The dredged material will be graded to elevations suitable for seeding, after placement at the disposal site.

SECTION 2 - FACTUAL DETERMINATIONS

PHYSICAL SUBSTRATE DETERMINATIONS

Lock and Dam 22 was constructed on a Mississippi riverbed cross section consisting of limestone bedrock at the lock, or western end, of the cross section and spans sand, sand and gravel, and finer sediments on the eastern end of the cross section.

Sediments accumulated over the period of operation of the facility are primarily silts and clays in the auxiliary lock area, where slack water has allowed finer suspended material to drop out of the water column. Sediments accumulated in the tailwater of the dam vary from location to location across the profile. The following section discusses in detail sediments from the auxiliary lock area as related to dredging activity. Substrate to be affected during overflow dam repair is that of the overflow section itself. This is a compacted earthfill dam surrounding a series of sheetpile cells and pile crosswalls. The dam is currently surfaced with riprap limestone rock.

Substrate affected by fine sediment disposal from the auxiliary lock will be an upland sand disposal area.

Actions taken to minimize impacts include coordination of disposal site selection with the U.S. Fish and Wildlife Service, Missouri Department of Natural Resources, Illinois Environmental Protection Agency, and Illinois Department of Transportation, Department of Water Resources. The disposal of up to 21,000 yd^3 of fine sediments from the auxiliary lock area is of primary concern. These sediments have been analyzed for various chemical parameters, with the results of analyses being shown on table 5. Physical and chemical composition of this material was considered when selecting a disposal site.

WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS

WATER

The project will take place in and around an inland freshwater stream system. Materials used, or discharged, during the project action are anticipated to be chemically stable. Therefore, no further consideration of salinity gradient is warranted for this action.

Water and sediment samples were taken during the summer of 1986. These samples were taken in the auxiliary lock area of the project site and were analyzed for ambient water, bulk sediment, and elutriate parameters and were compared to Missouri and Illinois water quality standards. Test results are found in tables 3 and 5. The ambient water concentration of iron exceeded the State standards, but most metal concentrations were below their respective detection limits. All pesticide concentrations were below the detection limit at all sites. Results are shown on table 3.

Missouri and Illinois do not have sediment quality standards; therefore, sediment quality was evaluated using the 1977, U.S. Environmental Protection Agency (EPA) publication entitled "Guidelines for the Pollutional Classification of Great Lakes Sediments." This publication classifies a sediment as being "nonpolluted," "moderately polluted," or "heavily polluted," depending on the concentration of selected parameters in the sediment. Table 4 lists the parameters studied in the U.S. EPA publication and their classification scheme.

TABLE 3

Ambient Water Concentrations of All Parameters
at Lock and Dam 22 on 7 August 1986
(in mg/l, unless stated otherwise)

Parameter	Location LD22-D3	LD22-U?
Arsenic	<.01	<.01
Barium	.19	<.1
Cadmium	.003	.003
Chromium (+3)	<.05	<.05
Chromium (+6)	<.05	<.05
Copper	<.01	.01
Cyanide	<.01	<.01
Lead	.01	.02
Mercury	<.0005	<.0005
Nickel	.01	.01
Selenium	.003	.003
Zinc	.01	.01
Ammonia Nitrogen	<.1	<.1
Un-ionized Ammonia	-	-
Nitrate Nitrogen	3.3	3.4
BOD	4	7
Oil and Grease	1	1
Phenols	<.01	.05
PCBs	<.0002	<.0002
Total Phosphate	.56	.60
Iron	1.1 *+	1.1 *+
Manganese	.13	.13
Total Suspended Solids	60	61
Total Dissolved Solids	277	272
Total Volatile Solids	106	98
Volatile Suspended Solids	3	5
Aldrin	<.00001	<.00001
Chlordane	<.00001	<.00001
DDD	<.0001	<.0001
DDE	<.0001	<.0001
DDT	<.0001	<.0001
Dieldrin	<.00001	<.00001
Endrin	<.00001	<.00001
Heptachlor	<.00001	<.00001
Heptachlor Epoxide	<.00001	<.00001
Lindane	<.00001	<.00001
Methoxychlor	<.01	<.01
Toxaphene	<.0002	<.0002
2,4-D	<.01	<.01
2,4,5-TP	<.001	<.001
Temperature (°C)	25.6	25.3
pH	8.09	8.18
Turbidity (NTU)	32	36
Dissolved Oxygen	7.09	6.95
Conductivity (umhos/cm at 25°C)	494	497

* Exceeds Missouri Protection of Aquatic Life Standard
\+ Exceeds Illinois General Use Water Quality Standard

TABLE 4

U.S. EPA Guidelines for the Pollutional Classification of Great Lakes Harbor Sediment (in mg/kg dry weight)

Parameter	Nonpolluted	Moderately Polluted	Heavily Polluted
Ammonia Nitrogen	<75	75-200	>200
Arsenic	<3	3-8	>8
Barium	<20	20-60	>60
Cadmium	*	*	>6
Chromium	<25	25-75	>75
Copper	<25	25-50	>50
Cyanide	<0.10	0.10-0.25	<0.25
Lead	<40	40-60	>60
Mercury **	-	-	-
Nickel	<20	20-50	>50
Oil and Grease	<1000	1,000-2,000	>2,000
PCBs **	-	-	-
Total Volatile *** Residue	<5	5-8	>8
Zinc	<90	90-200	>200

* Lower limits not established for cadmium

** If the concentrations of mercury or total PCBs are greater than or equal to 1 mg/kg or 10 mg/kg, respectively, the sediment is classified as polluted

*** Total volatile residue is expressed as a percent

TABLE 5

Bulk Sediment Concentrations of All Parameters in mg/kg Dry Weight, or as Stated Otherwise, at Lock and Dam 22 on 7 August 1986

Parameter	Location			
	LD22-D2	LD22-D4	LD22-U1	LD22-U3
Arsenic	1.8	2.5	3.8	2.4
Barium	68 *	120 *	36	78 *
Cadmium	.44	.87	1.0	.81
Chromium	3.4	16	14	12
Copper	2.2	14	15	12
Cyanide	<.1	<.1	<.1	<.1
Lead	4.8	20	91 *	17
Mercury	.13	<.10	<.10	.29
Nickel	7.7	23	22	20
Selenium	<1.0	2.1	1.0	1.2
Zinc	13	62	75	50
Ammonia Nitrogen	8.6	205 *	208 *	249 *
BOD	51	395	457	320
Oil and Grease	51	44	50	88
PCBs	<.2	<.2	<.2	<.2
% Total Iron	.47	2.0	1.7	1.5
Manganese	285	830	760	660
% Total Residue	78.7	54.7	59.1	67.5
% Total Volatile Residue	.47	5.5	4.4	4.6
Aldrin	<.005	<.005	<.005	<.005
Chlordane	<.025	<.025	<.025	<.025
DDD	<.01	<.01	<.01	<.01
DDE	<.005	<.005	<.005	<.005
DDT	<.01	<.01	<.01	<.01
Dieldrin	<.005	<.005	<.005	<.005
Endrin	<.01	<.01	<.01	<.01
Heptachlor	<.005	<.005	<.005	<.005
Heptachlor Epoxide	<.005	<.005	<.005	<.005
Lindane	<.005	<.005	<.005	<.005
Methoxychlor	<.01	<.01	<.01	<.01
Toxaphene	<.05	<.05	<.05	<.05
2,4-D	.35	<.01	.34	<.01
2,4,5-TP	<.01	<.01	<.01	<.01

* U.S. EPA guidelines for the classification of Great Lakes harbor sediments place this concentration in the "heavily polluted" category

Lock and Dam 22 bulk sediment analysis results are shown in table 5. Barium, lead, and ammonia nitrogen are the parameters with concentrations at one or more sites that place them in the "heavily polluted" category. Cyanide, polychlorinated biphenyls and all pesticide concentrations, except for 2,4-D at sites LD22-D2 and LD22-U1, were below the detection limit. Since site LD22-D2 consisted primarily of sand, it exhibited lower concentrations for most parameters than the remaining three sites which consisted primarily of silt and/or clay.

Five different elutriate settling times were used in the current study: 1, 8, 24, 48 and 96 hours. All 35 elutriate parameters were analyzed when a 1-hour settling time was used. When an 8-, 24-, 48- or 96-hour settling time was used, only 17 parameters were analyzed. Elutriate analysis results were evaluated against Missouri Protection of Aquatic Life Standards and Illinois General Use Water Quality Standards. A summary of elutriate test results, in comparison with State water quality standards, is shown in table 6.

Results from the elutriate analyses indicate, as shown in tables 6 through 9, that ammonia nitrogen (including its un-ionized form) would be the parameter of main concern if sediment adjacent to the auxiliary lock gates at Lock and Dam 22 were hydraulically dredged and the material disposed of in Missouri or Illinois. Other parameters which may exceed Missouri and/or Illinois water quality standards if dredged material disposal were to occur are arsenic, lead, mercury, copper, selenium and possibly cadmium.

If dredging were to occur during the fall or spring when water temperatures and pH values are lower, un-ionized ammonia nitrogen concentrations would be lower; therefore, there would be fewer violations of this standard.

Settling time appears to be an important factor affecting the concentration of numerous parameters. Heavy metals, which are closely associated with sediment, usually exhibited decreasing concentrations as settling times increased; however, ammonia, which is a dissolved parameter, usually showed little change with increased settling times. Results from the elutriate analyses indicate that an 8-hour settling period would usually result in a decrease in heavy metal concentrations versus a 1-hour settling period. Ammonia concentrations, however, usually showed little change as the settling time was increased.

Bulk sediment analysis results tended to indicate that barium could cause problems; however, the elutriate test results indicate that barium concentrations would not exceed either State standard.

Iron was the only ambient water parameter to exceed a State standard. Iron did not exceed Missouri or Illinois State standards in the elutriate analyses probably because the iron in the ambient water was associated with suspended particles, which apparently settled out during the settling stage of the elutriate test.

As currently proposed, dredging of accreted sediment around the auxiliary lock gates will be performed with a deck-mounted crane and clamshell bucket.

TABLE 6

Elutriate Concentrations of All Parameters (mg/l) at LD22-D2 from Samples Collected on 7 August 1986

Parameter	Settling Time				
	1-Hour	8-Hour	24-Hour	48-Hour	96-Hour
Arsenic	<.01	<.01	<.01	<.01	<.01
Barium	.22	.24	<.1	.20	.25
Cadmium	.002	.003	.003	.003	.016 *
Chromium	<.01	<.01	<.01	<.01	<.01
Copper	.02	<.01	.01	<.01	<.01
Cyanide	<.01	<.01	<.01	<.01	<.01
Lead	.05	.04	.03	.05	.02
Mercury	.0024	<.0005	.0082 *+	.0021 +	<.0005
Nickel	.04	.02	.02	.02	.02
Selenium	.003	.006	.008	.003	<.002
Zinc	.05	.02	.02	<.01	.02
Ammonia Nitrogen	1.5 *+	1.5 *+	3.6 *+	1.1 +	.82 +
Un-ionized Ammonia	.11 *+	.11 *+	.26 *+	.09 +	.06 +
BOD	16	1	55	10	13
Oil and Grease	1	-	-	-	-
PCBs	<.0002	-	-	-	-
Iron	.13	-	-	-	-
Manganese	.04	-	-	-	-
Total Residue	770	414	338	382	372
Total Suspended Solids	412	69	39	16	18
Total Volatile Residue	149	95	91	140	72
Aldrin	<.00001	-	-	-	-
Chlordane	<.00001	-	-	-	-
DDD	<.0001	-	-	-	-
DDE	<.0001	-	-	-	-
DDT	<.0001	-	-	-	-
Dieldrin	<.00001	-	-	-	-
Endrin	<.00001	-	-	-	-
Heptachlor	<.00001	-	-	-	-
Heptachlor Epoxide	<.00001	-	-	-	-
Lindane	<.00001	-	-	-	-
Methoxychlor	<.01	-	-	-	-
Toxaphene	<.0002	-	-	-	-
2,4-D	<.01	-	-	-	-
2,4,5-TP	<.001	-	-	-	-

* Exceeds Missouri Protection of Aquatic Life Standard
+ Exceeds Illinois General Use Water Quality Standard

TABLE 7

Elutriate Concentrations of All Parameters (mg/l) at LD22-D4 from Samples Collected on 7 August 1986

Parameter	Settling Time 1-Hour	8-Hour	24-Hour	48-Hour	96-Hour
Arsenic	.17 *	<.01	<.01	<.01	.03 *
Barium	.55	.15	.16	.35	.32
Cadmium	.004	.002	.002	.002	.004
Chromium	<.01	<.01	<.01	<.01	<.01
Copper	<.01	.01	<.01	<.01	.01
Cyanide	<.01	<.01	<.01	<.01	<.01
Lead	.06 *	.06 *	.05	.04	.04
Mercury	.0011	<.0005	.0028 *+	.0012 +	<.0005
Nickel	.03	.04	.03	.03	.03
Selenium	.023 *	.001	.010	.005	<.002
Zinc	.02	.03	<.01	<.01	<.01
Ammonia Nitrogen	10.3 *+	9.2 *+	1.1 +	9.7 *+	11.5 *+
Un-ionized Ammonia	.74 *+	.66 *+	.08 +	.69 *+	.82 *+
BOD	15	38	50	26	2
Oil and Grease	1	-	-	-	-
PCBs	<.0002	-	-	-	-
Iron	.67	-	-	-	-
Manganese	.70	-	-	-	-
Total Residue	737	523	553	552	556
Total Suspended Solids	248	81	69	26	71
Total Volatile Residue	185	145	120	93	109
Aldrin	<.00001	-	-	-	-
Chlordane	<.00001	-	-	-	-
DDD	<.0001	-	-	-	-
DDE	<.0001	-	-	-	-
DDT	<.0001	-	-	-	-
Dieldrin	<.00001	-	-	-	-
Endrin	<.00001	-	-	-	-
Heptachlor	<.00001	-	-	-	-
Heptachlor Epoxide	<.00001	-	-	-	-
Lindane	<.00001	-	-	-	-
Methoxychlor	<.01	-	-	-	-
Toxaphene	<.0002	-	-	-	-
2,4-D	<.01	-	-	-	-
2,4,5-TP	<.001	-	-	-	-

* Exceeds Missouri Protection of Aquatic Life Standard
+ Exceeds Illinois General Use Water Quality Standard

TABLE 8

Elutriate Concentrations of All Parameters (mg/l) at LD22-U1
from Samples Collected on 7 August 1986

Parameter	Settling Time				
	1-Hour	8-Hour	24-Hour	48-Hour	96-Hour
Arsenic	.03 *	.01	<.01	<.01	.02
Barium	.14	.28	.16	.25	.24
Cadmium	.003	.002	.002	.002	.001
Chromium	.04	<.01	<.01	<.01	<.01
Copper	.04 *+	<.01	<.01	<.01	<.01
Cyanide	<.01	<.01	<.01	<.01	<.01
Lead	.07 *	.04	.05	.03	.02
Mercury	<.0005	.0024 +	.0072 *+	<.0005	<.0005 +
Nickel	.06	.03	.02	.01	.02
Selenium	.004	.009	.008	.008	.034 *
Zinc	.10	.02	.01	<.01	<.01
Ammonia Nitrogen	9.5 *+	8.8 *+	9.5 *+	9.8 *+	10.9 *+
Un-ionized Ammonia	.81 *+	.75 *+	.81 *+	.83 *+	.93 *+
BOD	8	24	57	19	6
Oil and Grease	2	-	-	-	-
PCBs	<.0002	-	-	-	-
Iron	.40	-	-	-	-
Manganese	.18	-	-	-	-
Total Residue	2,090	506	421	410	402
Total Suspended Solids	1,550	162	107	44	76
Total Volatile Residue	234	116	100	136	89
Aldrin	<.00001	-	-	-	-
Chlordane	<.00001	-	-	-	-
DDD	<.0001	-	-	-	-
DDE	<.0001	-	-	-	-
DDT	<.0001	-	-	-	-
Dieldrin	<.00001	-	-	-	-
Endrin	<.00001	-	-	-	-
Heptachlor	<.00001	-	-	-	-
Heptachlor Epoxide	<.00001	-	-	-	-
Lindane	<.00001	-	-	-	-
Methoxychlor	<.01	-	-	-	-
Toxaphene	<.0002	-	-	-	-
2,4-D	<.01	-	-	-	-
2,4,5-TP	<.001	-	-	-	-

* Exceeds Missouri Protection of Aquatic Life Standard
+ Exceeds Illinois General Use Water Quality Standard

TABLE 9

Elutriate Concentrations of All Parameters (mg/l) at LD22-U3
from Samples Collected on 7 August 1986

Parameter	Settling Time				
	1-Hour	8-Hour	24-Hour	48-Hour	96-Hour
Arsenic	.02	.01	<.01	<.01	.02
Barium	.26	.33	.27	.24	.34
Cadmium	.003	.002	.003	.002	.002
Chromium	.01	<.01	<.01	<.01	<.01
Copper	.03 *+	<.01	<.01	<.01	<.01
Cyanide	<.01	<.01	<.01	<.01	<.01
Lead	.06 *	.06 *	.05	.02	.04
Mercury	<.0005	.0040 *+	.0041 *+	<.0005	.0007 +
Nickel	.05	.03	.02	.02	.03
Selenium	.009	.015 *	<.002	.004	.017 *
Zinc	.07	.02	.01	<.01	<.01
Ammonia Nitrogen	14.1 *+	12.9 *+	15.0 *+	14.0 *+	16.6 *+
Un-ionized Ammonia	1.20 *+	1.10 *+	1.28 *+	1.20 *+	1.41 *+
BOD	11	47	41	16	2
Oil and Grease	1	-	-	-	-
PCBs	<.0002	-	-	-	-
Iron	.33	-	-	-	-
Manganese	.08	-	-	-	-
Total Residue	1,330	529	462	469	465
Total Suspended Solids	550	187	92	98	66
Total Volatile Residue	208	120	103	99	93
Aldrin	<.00001	-	-	-	-
Chlordane	<.00001	-	-	-	-
DDD	<.0001	-	-	-	-
DDE	<.0001	-	-	-	-
DDT	<.0001	-	-	-	-
Dieldrin	<.00001	-	-	-	-
Endrin	<.00001	-	-	-	-
Heptachlor	<.00001	-	-	-	-
Heptachlor Epoxide	<.00001	-	-	-	-
Lindane	<.00001	-	-	-	-
Methoxychlor	<.01	-	-	-	-
Toxaphene	<.0002	-	-	-	-
2,4-D	<.01	-	-	-	-
2,4,5-TP	<.001	-	-	-	-

* Exceeds Missouri Protection of Aquatic Life Standard
+ Exceeds Illinois General Use Water Quality Standard

CURRENT PATTERNS AND CIRCULATION

Placement of steel and concrete for guardwall construction is not anticipated to negatively affect current patterns, velocity, stratification, nor hydrologic regime in the river system. Repair and upgrading of the upper approach dike and overflow dam should have no effect on hydraulic or hydrologic conditions in the project area.

Terrestrial discharge of material excavated from the emergency lock should have no effect on hydraulic or hydrologic conditions in the project area.

NORMAL WATER LEVEL FLUCTUATIONS

No effects on normal seasonal river stages are anticipated by the project actions.

SALINITY GRADIENTS

Refer to first paragraph under "Water," preceding.

ACTIONS TAKEN TO MINIMIZE IMPACTS

The use of chemically stable materials, physical stabilization of materials by design, and terrestrial disposal of fine, silty material are actions intended to reduce impacts to the riverine system.

SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

The discharge of rock for dike repair is anticipated to have only a minor, temporary effect as the material is placed and spread to design elevation.

The use of an upland disposal site for fine material from the emergency lock area is intended to prevent reentry of fine, dredged material into the water column of the Mississippi River.

Effects on the water column of the river system regarding light penetration, dissolved oxygen, toxic metals and organics, pathogens, and aesthetics are anticipated to be minimal and localized for a nominal distance downstream during the term of dredging and project construction.

Some potentially toxic materials have been identified in sediments to be dredged from the river system. Concentration of these materials, which could potentially exceed water quality standards in return water, are anticipated to be minimized through the dredge method (mechanical) and the disposal site selection (terrestrial) planned for this project.

DREDGING AND DISPOSAL

Effects on biota, including primary producers, i.e., zoo- and phytoplankton, suspension/filter feeders, and sight feeders are anticipated to be temporary and localized. Factors influencing these biotic components generally revolve around turbidity levels, which inhibit primary production by reducing light penetration, thereby affecting the entire food web of the riverine environment. Because the duration of increased turbidity levels is anticipated to be minimal, localized, and temporary, impacts to the aquatic community are expected to be negligible. Incorporation of disposed silt into bare sand at the disposal area is expected to provide long-term benefits.

Impacts are anticipated to be minimized by disposal site selection, dredging methodology, and the use of chemically noncontaminating and physically stable materials for project construction.

CONTAMINANT DETERMINATIONS

No dredged material contaminants have been identified which require special handling or treatment beyond that currently proposed for the project.

Contaminants identified from elutriate and bulk sediment analyses are generally part of the riverine system and are commonly suspended, transported, and deposited through normal fluvial processes in the Mississippi River.

AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

Because the likelihood of contamination by pollutants is generally low for projects involving rock placement, terrestrial disposal, and concrete placement, impacts to the aquatic ecosystem are anticipated to be negligible.

Review and consideration of 40 CFR, Section 230, Subparts D, E, F, and G involved analysis of the following effects:

a. Effects on Plankton
b. Effects on Benthos (bottom-dwelling organisms)
c. Effects on Nekton (free-swimming organisms)

d. Effects on Aquatic Food Web (refer to section 230.31)
e. Effects on Special Aquatic Sites Found in Project Area or Disposal Site

(1) Sanctuaries and Refuges (refer to Section 230.40)
(2) Wetlands (refer to Section 230.41)
(3) Mud Flats (refer to Section 230.42)
(4) Vegetated Shallows (refer to Section 230.43)
(5) Coral Reefs (refer to Section 230.44)
(6) Riffle and Pool Complexes (refer to Section 230.45)

f. Threatened and Endangered Species (refer to Section 230.30)
g. Other Wildlife (refer to Section 230.32)

Effects on plankton are anticipated to be minimal. Effects on benthos will be limited to elimination of those organisms currently inhabiting sediment accretions and the shore zones of the approach dike and overflow section. The placement of rock fill for scour protection should provide interstitial spaces for invertebrate population production and vertebrate spawning activity. Effects on nekton will be limited to displacement and temporary disruption of foraging patterns. Because the proposed activities are generally held to low flow (hence, non-spawning seasons), impacts to spawning species should be negligible. Impacts regarding various behavioral patterns during winter high stress periods would be restricted to the project site due to ice coverage and resultant weather-related construction restrictions. Effects on the aquatic food web are expected to be negligible. Effects on special aquatic sites should be negligible in the project area. No sanctuaries or refuges and no wetland or mudflats will be affected by the project action. No vegetated shallows, coral reefs, nor riffle and pool complexes will be affected by the project action.

Threatened and endangered species use of, or existence in, the project area is discussed in Section VI, Paragraph A, Endangered Species in the preceding Environmental Assessment.

Other wildlife, such as the river otter, muskrat, and beaver which would move through and around the project area, should only be affected to the extent of travel disruption. No food chain or critical habitat requirements will be significantly affected by the proposed actions.

PROPOSED DISPOSAL SITE DETERMINATIONS

The mixing zone for discharge of construction materials will be the water column, approximately 20 feet deep in the pool and 2 to 5 feet deep around the approach dike and overflow section of the dam. Dam gates will be closed sequentially to allow floating plant access to the construction site. This is anticipated to reduce current velocity and turbulence in order to facilitate material placement. Depending on river conditions, this discharge will

take several weeks to complete. The lack of fine particulates typically contained in rock, steel, and concrete fill indicates negligible chemical or turbidity effects resulting from this action.

Water quality standards for Missouri and Illinois are represented on table 10. Test results indicate that ammonia and un-ionized ammonia nitrogen are the most likely water quality standards which may be violated by the project activity. However, the proposed dredging and disposal methods for material containing all contaminants are expected to minimize contaminant reintroduction to the water column.

The proposed project should have no effect on municipal or private water supplies, recreational or commercial fisheries, or water-related recreation. Aesthetics are generally negatively affected by any type of construction activity; however, for this project, no permanent effects are anticipated due to lack of visibility or structures (underwater) and location of other disposal sites. A parcel of Federal land adjacent to the town of Saverton is the site preferred for dredged disposal. Aesthetic impacts from the presence of disposal equipment are anticipated to be temporary. Use of this area has been coordinated with, and considered acceptable by, appropriate Federal, State, and local officials.

DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

Due to the temporary period of construction activities affecting the aquatic environment and the overall negligible effects of approach dike repair, overflow dam repair, and auxiliary lock clean-out, cumulative effects of the project are anticipated to be minimal.

DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

No secondary effects on the aquatic ecosystem are foreseen at this time. This determination is subject to reevaluation, if warranted by Federal, State, or local agency comment, as well as input from the general public.

SECTION 3 - FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

1. No significant adaptions of the 404(b)(1) guidelines were made relative to this evaluation.

2. Evaluation of Practicable Alternatives (Refer to EA Section III.)

a. No Federal Action. This alternative was not selected because sediment removal from the emergency lock is necessary for rehabilitation activities in both the emergency and main locks.

TABLE 10

Illinois General Use Water Quality Standards and Missouri Protection of Aquatic Life Standards in mg/l for Comparison Against Applicable Ambient Water and Elutriate Parameters

Parameter	Illinois General Use Water Quality Standard	Missouri Protection of Aquatic Life Standard
Ammonia Nitrogen	*	-
Arsenic	1.0	0.02
Barium	5.0	-
Cadmium	0.05	0.012
Chromium (+3)	1.0	-
Chromium (+6)	0.05	-
Chromium (Total)	-	0.05
Copper	0.02	0.02
Cyanide	0.025	0.005
Iron	1.0	1.000
Lead	0.1	0.05
Manganese	1.0	-
Mercury	0.0005	0.002
Nickel	1.0	0.100
Phenols	0.1	0.100
Selenium	1.0	0.01
Total Dissolved Solids	1,000	-
Un-ionized Ammonia Nitrogen	*	0.1
Zinc	1.0	0.100

* Ammonia nitrogen shall never exceed 15 mg/l. If ammonia nitrogen is less than 15 mg/l and greater than or equal to 1.5 mg/l, then un-ionized ammonia nitrogen shall not exceed 0.04 mg/l.

AD-A184 417 ENVIRONMENTAL ASSESSMENT FOR LOCK AND DAM 22 MAJOR' 2/2
REHABILITATION RALLS COUNTY MISSOURI AND PIKE COUNTY
ILLINOIS(U) ARMY ENGINEER DISTRICT ROCK ISLAND IL
UNCLASSIFIED FEB 87 F/G 13/2 NL

END
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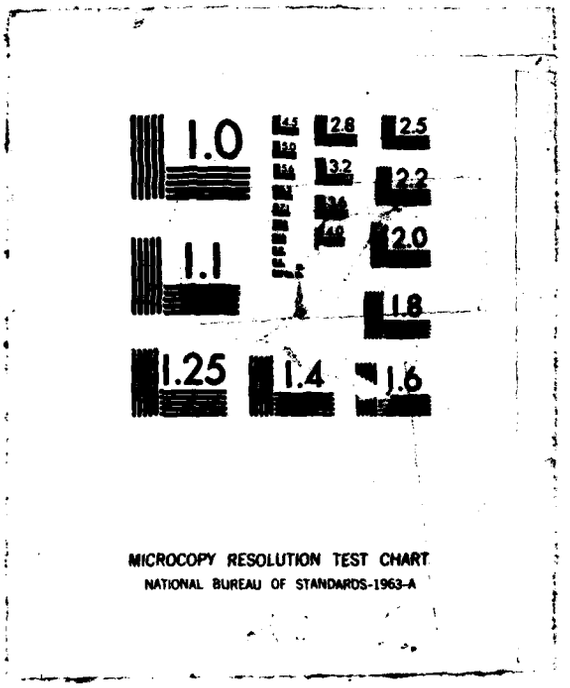

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

b. Agricultural Field Disposal. This alternative would involve locating a parcel of nearby cropland on which to hydraulically pump dredged material. Due to the limited range of most small hydraulic pump systems, anticipated pump-clogging debris in the sediment, and the nature of the sediment itself, hydraulic dredging does not appear feasible.

Mechanically dredged material also could be disposed of on cropland, however, excessive handling reduces the acceptability of this alternative.

c. Previously Used Downstream Sites. In addition to their limited size and low elevation, these sites are fairly well revegetated. The preferred site is unvegetated and of slightly higher elevation, presenting potential for site improvement through disposal and revegetation of fine materials.

d. Proposed Project Action. The proposed actions, described in Section II - Project Description, are considered environmentally and economically acceptable as planned. Disposal sites and dredging methodology have been selected to reduce water quality impacts as well as impacts to the riverine system. Sites for disposal are primarily upland in nature, and materials discharged will be chemically noncontaminating and physically stable.

3. Permits, certification, or waiver of certification under applicable Sections of the Clean Water Act will be obtained before construction begins. The project will thus be in compliance with water quality requirements of the States of Missouri and Illinois.

4. The project is not anticipated to introduce significant quantities of toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials.

5. No significant impact to Federal or State listed endangered species will result from this project.

6. The project is situated along a freshwater river system. No marine sanctuaries are involved or would be affected by the project actions.

7. The project action is part of a federally authorized major rehabilitation project for Lock and Dam 22, Saverton, Missouri.

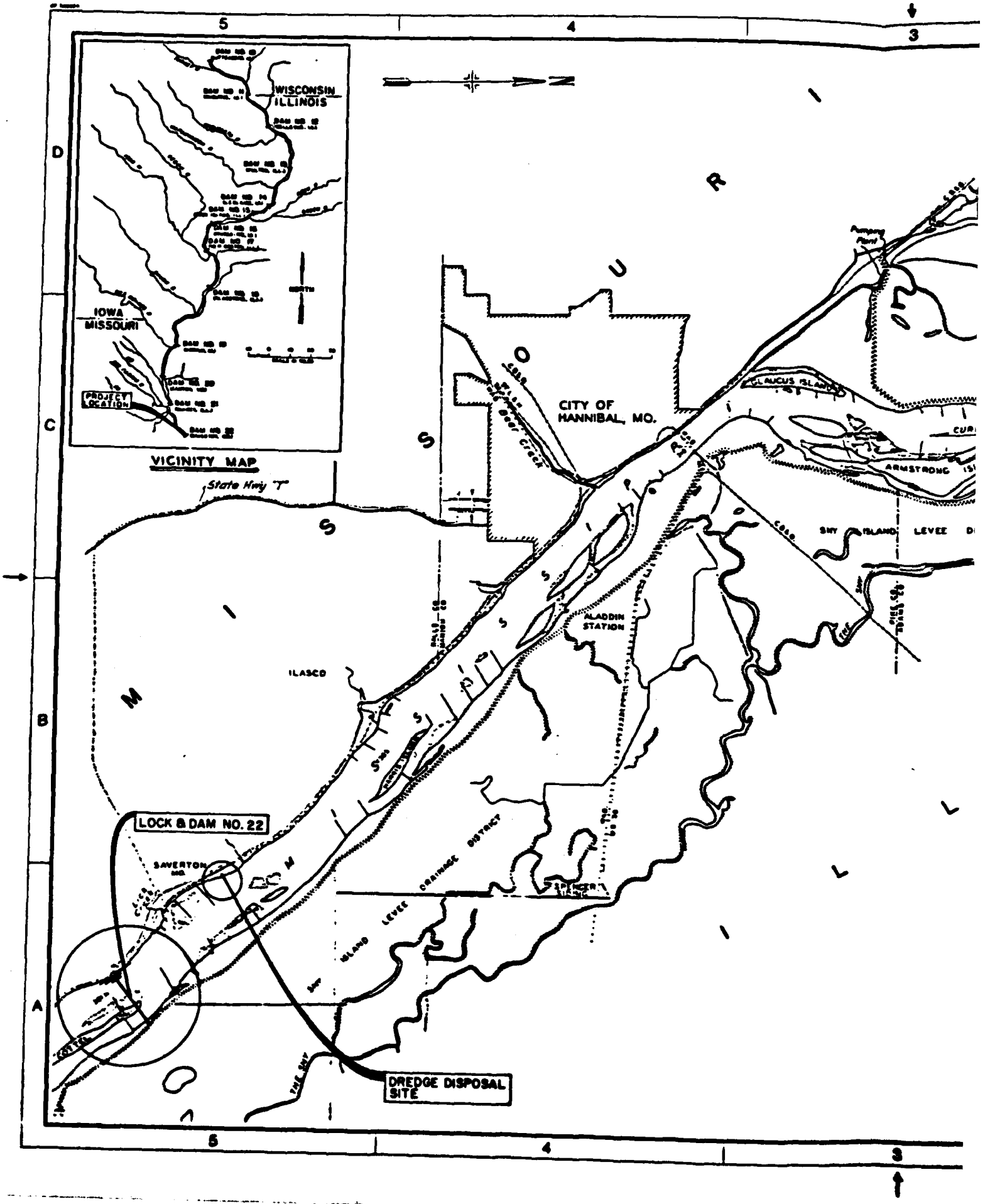
No municipal water supplies will be affected by the proposed action and no degradation of waters of the United States is anticipated by the proposed Federal action.

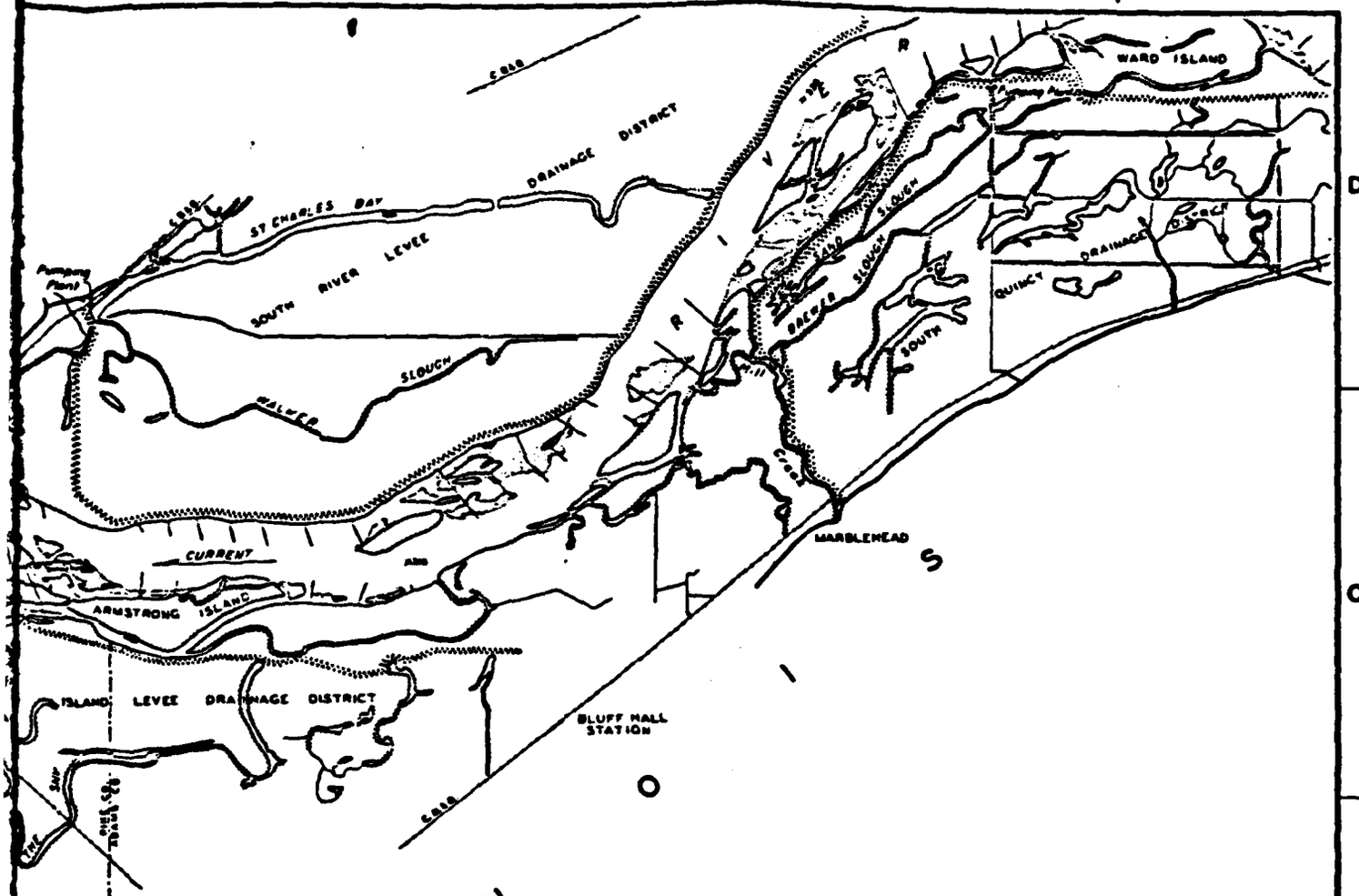
8. The materials used for construction will be chemically and physically stable and noncontaminating.

9. No other practical alternatives have been identified. The proposed actions are in compliance with Section 404(b)(1) of the Clean Water Act, as amended. The proposed action will not significantly impact water quality and will improve the integrity of an authorized navigation system.

Date

Neil A. Smart
Colonel, Corps of Engineers
District Engineer


WISCONSIN
ILLINOIS
IOWA
MISSOURI
PROJECT LOCATION
VICINITY MAP
CITY OF HANNIBAL, MO.
State Hwy "T"
ILASCO
ALADDIN STATION
LOCK & DAM NO. 22
SAVERTON
DREDGE DISPOSAL SITE
DRAINAGE DISTRICT
ISLAND LEVEE
ARMSTRONG
5
4
3
A
B
C
D



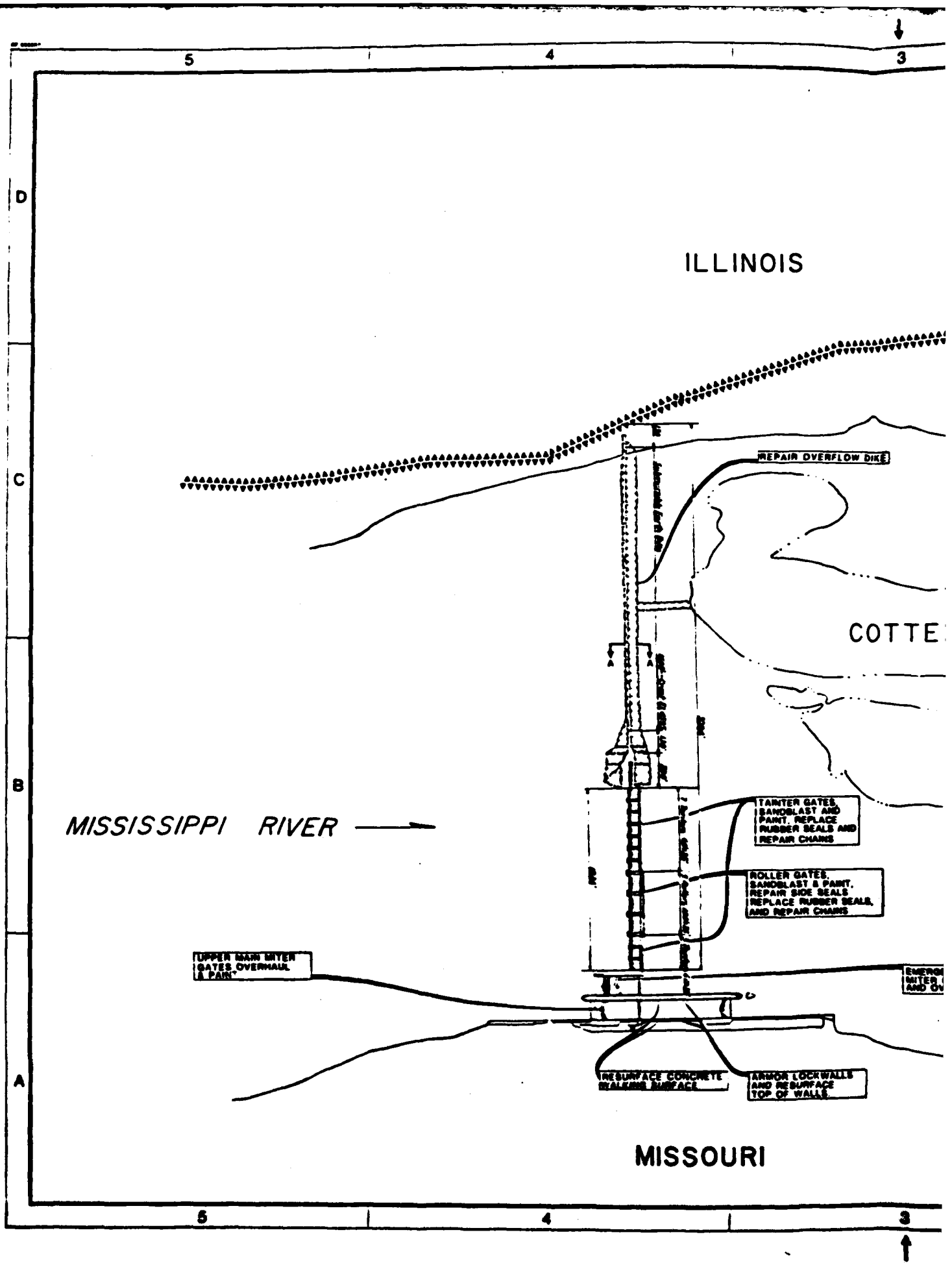
Note:
Mileage shown is upstream from the mouth of the Ohio River

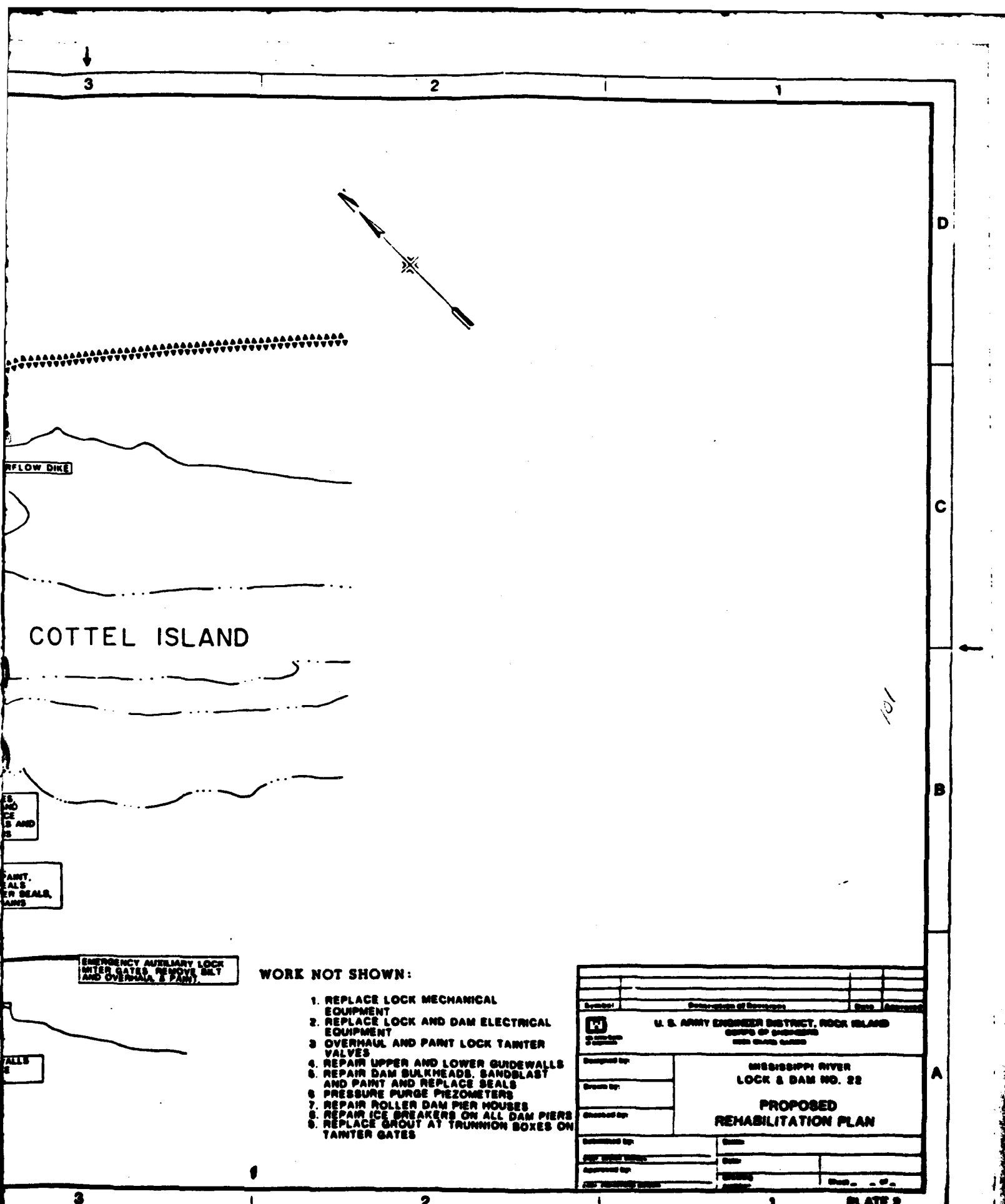
U. S. ARMY ENGINEER DISTRICT, ROCK ISLAND
CORPS OF ENGINEERS

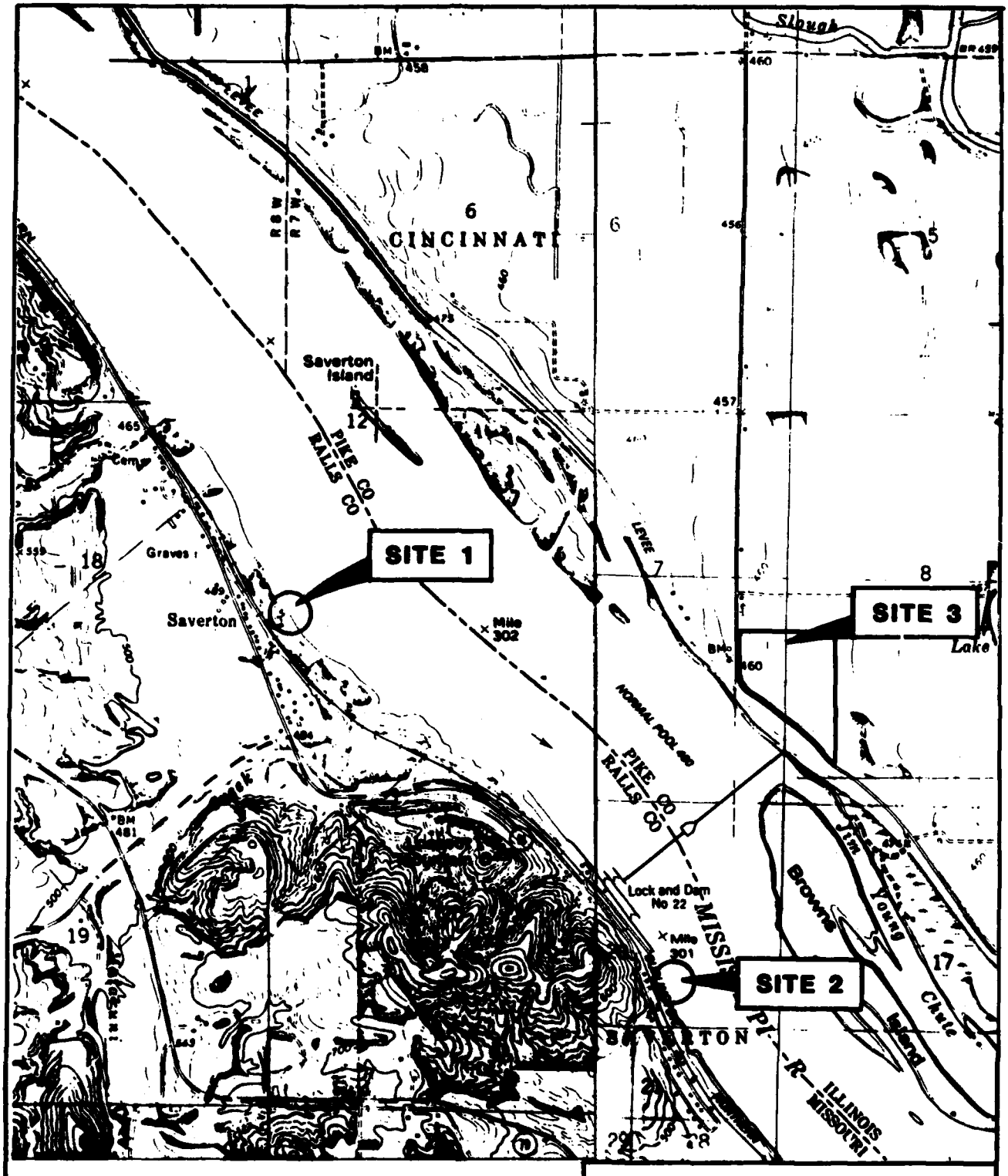
MISSISSIPPI RIVER
LOCK & DAM NO. 22

PROJECT LOCATION

PLATE I


5
4
3
D
C
B
A
ILLINOIS
REPAIR OVERFLOW DIKE
COTTE
MISSISSIPPI RIVER
TAINTER GATES, SANDBLAST AND PAINT, REPLACE RUBBER SEALS AND REPAIR CHAINS
ROLLER GATES, SANDBLAST & PAINT, REPAIR SIDE SEALS REPLACE RUBBER SEALS, AND REPAIR CHAINS
UPPER MAIN MITER GATES, OVERHAUL & PAINT
RESURFACE CONCRETE
ARMOR LOCKWALLS AND RESURFACE TOP OF WALLS
MISSOURI


3
2
1
D
C
B
A
RFLOW DIKE
COTTEL ISLAND
EMERGENCY AUXILIARY LOCK
INTER GATES, REMOVE SILT
AND OVERHAUL & PAINT).
WORK NOT SHOWN:
1. REPLACE LOCK MECHANICAL EQUIPMENT
2. REPLACE LOCK AND DAM ELECTRICAL EQUIPMENT
3. OVERHAUL AND PAINT LOCK TAINTER VALVES
4. REPAIR UPPER AND LOWER GUIDEWALLS
5. REPAIR DAM BULKHEADS, SANDBLAST AND PAINT AND REPLACE SEALS
6. PRESSURE PURGE PIEZOMETERS
7. REPAIR ROLLER DAM PIER HOUSES
8. REPAIR ICE BREAKERS ON ALL DAM PIERS
9. REPLACE GROUT AT TRUNNION BOXES ON TAINTER GATES
U. S. ARMY ENGINEER DISTRICT, ROCK ISLAND
CORPS OF ENGINEERS
MISSISSIPPI RIVER
LOCK & DAM NO. 22
PROPOSED
REHABILITATION PLAN
PLATE 2



PROPOSED
DISPOSAL SITE LOCATIONS

PLATE 3

DISTRIBUTION LIST

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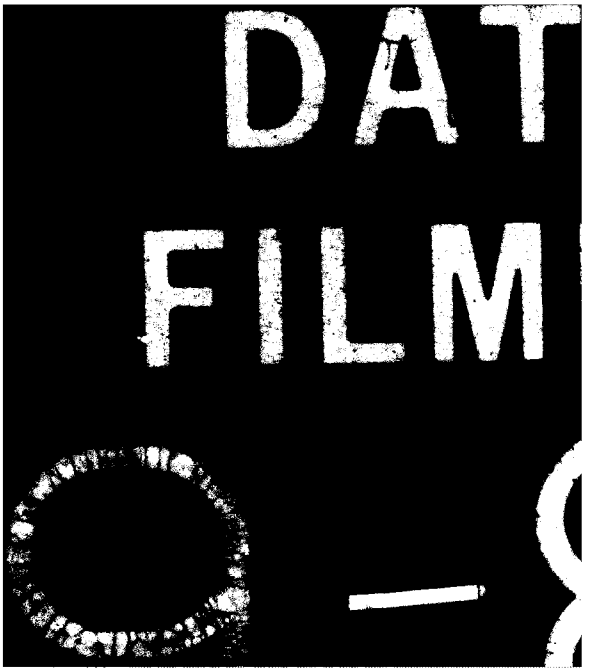
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